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SUGGESTIONS

RECEIVED BY THE

Agricultural & Horticultural Society

OF

INDIA

FOR EXTENDING THE

CULTIVATION AND INTRODUCTION

OF

USEFUL AND ORNAMENTAL PLANTS,

WITH A VIEW TO

THE IMPROVEMENT OF THE AGRICULTURAL AND COMMERCIAL RESOURCES OF INDIA.

COMPILED BY

HENRY HARPUR SPRY, M.D., F.R.S., F.G.S.

Secretary Agricultural and Horticultural Society of India.

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PUBLISHED BY AUTHORITY OF GOVERNMENT.

CALCUTTA:

BISHOP'S COLLEGE PRESS.

MDCCCXLI.

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INTRODUCTION.

In the course of the year 1838 it occurred to the Right Honorable the Governor General to address the home authorities on the subject of the advantage likely to accrue to the British Indian Empire by undertaking, at the expence of the state, experiments on an extensive scale for naturalizing in India useful and desirable plants indigenous to other countries.

The Honorable the Court of Directors of the East India Company in its reply, under date the 13th of February 1839, expressed its full concurrence in the suggestion, and intimated that a resolution had been passed, gradually to furnish means for carrying the recommendation into effect.

A copy of the despatch containing the sentiments of the Court, the Right Honorable the Governor General in Council was pleased to have forwarded to the Agricultural and Horticultural Society of India.

On its receipt the Society voluntarily came forward with an offer to aid, as far as in it laid the power, the purposes of the Government in an enterprise so much in accordance with its own usages and wishes, and for this purpose a Committee from among the members of the Society was formed for the purpose of suggesting such plants and trees as might be desirable for introduction into India, or that could be supplied to other countries.

In order to carry out these intentions the Committee addressed a great number of persons, and invited assistance in the form of suggestions from all quarters.

This was the second time the Society had put

forth circulars inviting information from among the body of the English community in India; for in the year 1837 a list of queries, to the number of thirty-four having reference to the general agricultural features and capabilities of the various provinces under the Bengal and Agra Governments was distributed over the country.

On the second occasion, however, the dissemination of the circular was extended to the Madras and Bombay Presidencies.

The Committee after a time had the gratification of receiving some valuable returns, especially at the hands of the Bombay Government, and the announcement of the circumstance was made to the Society in a final report, which was submitted at the General Meeting in July 1840.

The recommendations which the Committee brought up were approved of by the Society,

and it was resolved, in consequence of the subsequent receipt from the Supreme Government of a copy of a despatch from the Honorable Court of Directors, dated July 24, 1839, in which it is said—" we purpose from time to time to print and publish such information as may come before us calculated either to extend the knowledge of the productions of India, to increase their amount, improve their quality, or give stimulus to the demand for them; and we desire that you will cause similar measures to be taken for effecting the same objects throughout India," to transmit the Report to Government with the several communications which had been received in reply to both the circulars, in order that the Government might see the real nature of the documents which the Society had chosen to recommend to favourable consideration, and if it thought proper, incur the expense of preparation and publication by the Society.

The Right Honorable the Governor General in Council was pleased in reply to express his

" thanks to the Society for the communication of the papers, which though they embraced a less wide range than might be desired, were deemed most valuable, and in some instances did very great credit to their writers, from the well directed zeal and spirit of observation which they displayed."

His Lordship in Council therefore intimated that he " readily sanctioned the expense which would be necessary for the publication of such portions of them as the Society might deem useful."

Under these auspices the papers now given to the public make their appearance. As a first attempt to bring together a few of the many wants of India, it is thought that they may not prove uninteresting, although it must be avowed that the results are extremely imperfect. Nevertheless the information received is, in many respects, valuable, and it is hoped that the publicity now given to them may

lead to further and yet more important researches.

Of the objects which suggest themselves, after their perusal, as worthy of being well worked out,—the interchange of plants between Bombay and Calcutta—the growth, price, and manufacture of the Sanseviera—the preservation and stocking of fodder for the dry season, and particularly the application of the refuse leaves of the sugar cane to this purpose, may be mentioned as appearing to invite notice, and to this the attention of the Society will be early directed.

THE COMPILER.

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SUGGESTIONS

FOR EXTENDING THE

Useful and Ornamental Botany of India,

IN CONNECTION WITH THE

IMPROVEMENT OF THE AGRICULTURAL AND COMMERCIAL RESOURCES OF THE COUNTRY.

Western India.

From DR. BROWNE, *Private Secretary to the Honorable the Governor of Bombay, to* DR. SPRY, *Secretary to the Agricultural and Horticultural Society of India.*

MY DEAR SIR,

Bombay, Government House, 11th March, 1840.

The accompanying are replies to some of your queries submitted in your circular of the 25th October last. If, imperfect as they are, they be of any use, Sir James Carnac will be happy.

Yours in much haste, very faithfully,

R. BROWNE, M. D. P. S.

From MR. NIMMO, *to* DR. BROWNE, *Private Secretary to the Honorable the Governor of Bombay, dated 23rd of December*, 1839.

I have now the pleasure to acknowledge the receipt of your note, dated 25th ultimo, and of its enclosure, on a subject to which I fear I shall not be able to do justice, though I have long felt an intense interest in it; but as I believe the Agri. and Horticultural Society of India is in *good earnest*, and as the subject has now attracted the attention of the higher authorities in England, I hope something may be accomplished towards ensuring the great and ultimate object contemplated by the Honorable the Court of Directors, especially if supported by the recommendation of our present illustrious Governor.

I beg to send the accompanying list of such useful trees and plants as I consider appropriate to our soil and climate, with a few exceptions experimentally, and as these lists must speak for themselves, I have but a few remarks to submit, which I shall do in my own plain and simple way, the subject requiring no laboured report, and being one that must be *tried* before we can confidently pronounce on any success

attending it, for it is difficult, in many instances with regard to "Exotics," to affirm *a priori*, what may thrive in our neighbourhood, since a great many from New Holland, are known to resist our temperature, and prosper in spite of isothermal doctrines. Generally speaking, all the vegetable productions of the equatorial zone, (tropics), not growing above the altitude of 5000 feet, may be expected to succeed here; and of this description chiefly are those comprised in the lists.

Having these materials in our possession, it would not be difficult to elaborate them; that is, to preserve, propagate, and convert them to use to the best possible advantage, so as to make them produce the most valuable exports, articles of home consumption and manufacture, and thus give a new life to the industry and commerce of this country; and though little is known of some of them, both medicinal and those used in the arts, yet a most ample field is presented to us in India to unfold the extent of their power and utility.

To ensure success, I beg to submit the necessity of making the introduction of useful plants here the subject of an experiment, to be conducted on a magnificent scale, equal to the vast importance of

the result to be expected, else *ages must roll on*, before any benefit could possibly be reaped.

Suitable localities might no doubt be found for a nursery, and for plantations of the most useful productions of other countries in the territories under this Presidency, and I beg to point out particularly for this purpose, the neglected Island of Salsette, the tract along the Ghauts between Dhurrumpore and the Taptee, as being well adapted for the cultivation of timber trees; the valley of Candeish for fruit trees, exotic; the banks of the Nerbuddah, the Vindhyan range, and the country between Ahmedabad and Ahmednuggur, northward for timbers, fruit trees, and medicinal plants, from the temperate parts of the globe. It is scarcely necessary for me to observe, that the choice of the site of the present Botanic Garden in the Deccan is by no means eligible, as even the very grass seems to be reluctant to grow on the arid plains of the Ghauts.

In a report from the Superintendent at the Botanic establishment at Dapooree, which has casually fallen into my hands, I observe, he has declared himself incompetent to give an opinion on the momentous question of forming Teak and other tim-

ber plantations. I regret the circumstance the more, as having had a tendency perhaps to induce the Government to abandon all attempts of the kind; and though he particularly recommends the extension of a common tree here, the Babool, termed by him "a most valuable one and our natural timber," yet there are others of equally spontaneous growth, and far superior qualities, namely the Chuckrassia tabularis, a new species lately discovered in the Concan,* and the Cedrela Toona, all which would seem to have remained hitherto unknown (singular enough); added to the Chloroxylon Swietenia, Calophyllum Inophyllum, and Shorea robusta, which might be made the object of extensive cultivation in our vicinity; while the expediency of forming a teak plantation in the S. Concan merits the attention of the Government—where the combined effects of heat and moisture are more calculated to develope the gigantic dimensions of that prince of our timber forests.

I regret we have nothing to give in return for what we may expect from Bengal, except the Calysaccion longifolium, used as a dye-stuff—so poor is

* This tree was discovered by Mr. Nimmo himself on the Toonger Hills, Dec. 1838. It is now called C. Nimmonii by Dr. Wight.—H. H. S.

the nature of our vegetation here; but should there be any other in a list published recently for the Agricultural and Horticultural Society of Western India—a copy of which should be forwarded to Calcutta—we shall be happy to furnish them.*

If the principle of reciprocity be strictly adhered to, we may perhaps not be able to calculate upon receiving any very splendid supply from that quarter. In the ornamental department, I have included all such plants and trees as may add to the picturesque beauties of our landscape scenery.

In concluding, I may mention, that I feel gratified at the idea of having in some degree anticipated the Court's wish, by introducing a few useful exotics here, and flatter myself that I shall soon be able to add a great many more to the number; but my efforts as a private individual must at all times be feeble and limited. Had I possessed the means, I should not have hesitated a day in fitting out an expedition expressly for the purpose of enriching

* Two copies of this valuable publication have been received from the Bombay Society. I understand from Dr. Wallich, that he has sent a copious list of desiderata, extracted from this work to the Society and others, and has had several very interesting communications of seeds, with the promise of many more, as well as of supplies of living plants.—H. H. S.

this part of India with the useful and noble vegetable productions of other parts of the world, for the benefit of the countless poor; for nothing could make one more happy than to look back, after a long run, on a life spent in doing good to our fellow-creatures.

Extract of letter from Mr. NIMMO, *at Bombay, to* Dr. SPRY, *Secretary to the Agricultural and Horticultural Society of India, dated Colaba, December* 18, 1840.

I had much pleasure in receiving yours of the 25th ultimo, and feel very happy that Lord Auckland and the Agricultural Society of India have duly appreciated our humble efforts to point out a few of the "agenda," towards improving that most fruitful source of our wealth in India, namely, the vegetable kingdom. It is gratifying at the same time to see the interest taken on your side of India in this matter, so that nothing but good can come of it. I could wish, most cordially wish, we here had possessed but half of your public spirit and spiritedness.

I am happy you have such able and indefatigable coadjutors as Drs. Wallich, Falconer, O'Shaughnessy, and Wight.

Timber—Gums, &c. used in the Arts.

African Teak (genus unknown,) Adelia castanicarpa, Anona palustris, Anda brazilîensis, Amyris ambrosiana, Araucaria excelsa, Urceola elastica, Aralia umbellifera, Augia sinensis, Acacia Verek, vera, nilotica, and Seyal, Amyris Kataff and Kafal and Commiphora, Aquilaria Agallochum, Acacia juliflora and arborea, Aloexylon Agallochum, Acacia senegalensis, Alseodaphne grandis, Amyris hexandra, Acacia tortuosa and Zamang, Amerimnum Ebenus, Amyris guianensis and Agallocha, Andersonia Panchmoun, Aquilaria secundaria, Aloexylon Loureirii, Acacia cochliocarpa, Aromadendron elegans, Amasonia arborea, Amyris altissima. Altingia excelsa, 200 feet high, or Lignum Papuanum.

Bursera gummifera, Bucida Buceros, Broussonetia papyrifera, Bursera paniculata and acuminata, Big-

nonia Chica, ipe—tabacco and ipeuna, Broussonetia tinctoria, Berrya Amonilla, Baphia nitida, Balsamifluæ of Java, Barba de Tigre of Humboldt.

Caesalpinia coriaria, braziliensis, crista and echinata, Camellia oleifera, Caoutchouc tree of Africa, (see Tuckey's Congo, p. 444,) Calamus Draco, Ceroxylon Andicola, Combretum Güyacă, Caladium seguinum, Cynanchum albiflorum, Condaminea tinctoria, Calambac wood, Carana and chibou gum trees, Cynanchum ovalifolium, Canarium microcarpum, Caryocar amygdaliferum, tree 240 feet high, Carapa guianensis, Coulteria tinctoria, Crudya aromatica, Cremanium tinctorium, Cæsalpinia oleosperma, Calophyllum bintangor and angustifolium, Calamus rudentum, and verus, Amyris balsamifera, Croton thurifer, Cupressus resinifera, Cavanille sia mocondo, eight feet in diameter, Croton laccifer, Calamander wood of Ceylon, Cratoxylon Hornschuchii, Cordia Gerascanthus, Cedrus Deodara, 30 feet in girth. Cedrela odorata, Cinnamomum Tamala, albiflorum, eucalyptoides, nitidum and Kiamis, Corypha tectorum and cerifera.

Dammara australis, Dacrydium taxifolium, Dalbergia Sissoo, Drymis chilensis, Duvaua dependens

and dentata, Diospyros, black wood of Amboyna and Mauritius, Dipterocarpus turbinatus, costatus, incanus, and alatus, Dalbergia latifolia, and emarginata, Dalbergia monetaria, Dammara selanica, Dipterocarpus trinervis, 200 feet high, Dapiche gum tree, Dipterix ordorata.

Elæodendron Argan, Erythrina monosperma, Elæcocca vernicia, Elæococcus verrucosus, Euonymus tingens, Engelhardtia Roxburghiana, Erythrina sublobata, Elaphrium excelsum, Echinocarpus Sigun, 120 feet high.

Ferula assafœtida, Fagus obliqua, Flindersia australis, Fraxinus excelsior.

Gomortega nitida, Galipea resinosa, Gordonia integrifolia, Gamboge tree.

Hopea decandra superior to teak wood, Heisteria coccinia, Hevea guianensis, Hibiscus arboreus and strictus, Humirium balsamiferum, Hedwigia balsamifera, Hopea scaphula, Heudelotia Africana or Senegal olibanum.

Icica racouchini, heptaphylla, Icicariba and Carana, Icica Tacamahaca, Jatropha elastica, Juniperus elata, Icica heterophylla, guanensis, and altissima, Jacaranda rose-woods.

Khaya Senegalensis.

Litsea sebifera, Luhea paniculata, Laurus Benzoin, Liquidambar styraciflua, Laurus Parthenoxylon and linguè, Laurelia aromatica, Lobelia Caoutchouc, Lætia guidoneá. Lucuma Caimito and mammosa, var. Bully tree.

Morus cucullata* and tinctoria, Myrica cerifera, Malva crispa, Microlæna spectabilis, Myrica ethiopica, Marignia obtusifolia, Mastixia pentandra, Melanorrhœa usitata, Mimosa elata, Millingtonia simplicifolia, Mimosa rose-woods of Brazil, Melanoxylon Brauna, Maba ebenoxylon, Marsdenia tinctoria, Maranta dichotoma, Moronabea coccinea,—Magnolia excelsa? Macrocnemum tinctorium, Myrodendron amplexicaule.

Nerium coccineum, Nicterisition lanceolatum.

Oxleya xanthoxyla, Omphalocarpum procerum, Ocotea cymbarum.

Pinus dammara or Dammara alba of Rumphius, Pinus Lambertiana and Douglassii, Prinsepia utilis, Pistacia Terebinthus and atalantica, Pterocarpus dalbergioides, Phormium tenax, Pterocarpus erinacea, Physocalymna floribunda,—rose-wood, Pinus sylvestris, Pterocarpus gummifer, Pistacia oleoso, Poivrea alternifolia, Phaleria robusta, Paraguatan

* For feeding silk-worms.

wood tree of Guiana, Pinus longifolia, Deodara and Santalinus, Pistacia lentiscus, Parivoa grandiflora, Psidium montanum 100 feet high, Platanus occidentalis 16 feet in diameter, Pine trees of Ava.

Quercus robur? semicarpifolia, lancefolia, muricata, glomerata, depressa, tinctoria and Suber.

Rhus vernicifera, aromatica, vernix, caustica, copallina, and coriarea, Rhus molle and glabrum, Robinia pseudo-acacia, Rottlera tetracocca.

Swietenia Mahogoni, Siphonia elastica, Sterculia Tragacantha, Stagmaria verniciflua, Schinus Molle, Senacia undulata, Stalagmites cambogioides, Shorea robusta, Laurus, volatile oil of Guiana and Oronoko, Symplocos racemosa, Shorea Tumbugaia and Talura, Siphonia brasiliensis, Swartzia myrtifolia, Swartzia tomentosa, Strigilia oblonga, Swietenia senegalensis and chickrassia, and trilocularis, Sideroxylon nitidum and mastichodendron, Sickingia erythroxylon.

Terminalia vernix and latifolia, Tacamahac gum tree. Tectona Hamiltoniana, Terminalia citrina, Tetranthera nitida, and sebifera, Thuja articulata, Terminalia alata, and argentea.

Urceola elastica, Ule tree or Castilla elastica, Uncaria gambir, Urtica tenacissima, Unona aromatica.

Virola sebifera, Vateria Indica, Vatica laccifera, Vahea gummifera.

Curucay resin tree of Humboldt, 130 feet high.

The yellow, red, and iron wood, and Ebony of Bowdich.

The Olamboo, or Caoutchouc tree of Bowdich.

The Odjoo, or torch-wood tree of Bowdich.

Araucaria Brasiliensis. The Acassie indigo plant, and the Neoondoo tree of Bowdich. The wild Cedar and Mahogany, the Coloquintida, or bitter apple tree, the Cotamma tree, bearing aromatic and fragrant pods, the tree producing an odoriferous resin resembling Camphor or Benjamin, the Gum sandarach tree, the red and yellow dye woods, and the Erasma tree of Dupuis.

The balsam and B'dellium tree, the Cedar and Match trees of Salt. The yellow dye wood waver of Pearce. The Ganvar, the Wanzatra gum, the Soap-nut trees, the Zanen, or red dye wood, and the ink trees of Pearce. Panax chrysophyllum 100 feet high. Guarea grandifolia. Dhanasaree wood. Larix Cedar of Lebanon. Mora excelsa, 20 feet girth. Juniperus Barbadensis and Bermudiana. Santalum Freycinetianum, Peronema canescens.

Petrocarya excelsa. The Coggar wood of Col. Todd. Wormia excelsa, Pinus resinosa. Dacrydium excelsum. Acacia Melanoxylon. Taxodium of Douglas, 300 feet high. Eucalyptus resinifera. Metrosideros robusta. Phyllocladus trichomanoides. Myrsine Rapanea. Prunus salicifolia. Vitex litoralis. Podocarpus totarra. Icica Carana and Mani and cuspidata, Myrtus longifolia 100 feet.

Javicou, white Varnish tree of Humboldt. Laurus nitida, Kiamis, and Javitensis. The Curvana, or white Caoutchouc tree of Humboldt. Bagassa guianensis, Hedera umbellifera. Bignonia tulipifera and gigantea.

Pterocarpus santalinus. Cordia macrophylla. Resina Carneola of Rumphius, Ebenus alba, Metrosideros moluccana, Dabanus, Sicchius, Lignum Leve, Decadia aluminosa, Lignum momentaneum and moschatum, Panax pinnatum, Arbor nigra ebenum, Metrosideros amboinensis, Canarium Zephyrinum, silvestre, alterum, odoriferum and hirsuta, Damara nigra, celebica and ligitima, Nanarium minimum or oleosum, Canarium decumana, Lacca lignum, Caju Gora Aruani.

Melaleuca leucadendron, Ocotea lineata and Javitensis. Anacardium occidentale. Sebastiao de

Aruda, Coracaodo Negro, Jacaranda-tun, an excellent kind of mahogany, Masaranduva, Cabiuna, Perova, Parauna, jequetiva Cedro, mentioned by Spix. Hopea Wightiana, Pterocarpus Wallichii, Vateria Roxburghians, Vatica laccifera.

Fodder Grasses, &c.

Panicum Jumentorum,* Spectabile and other fodder grasses of Brazil, Grewia didyma, Poterium spinosum, Paspalum stoloniferum and corymbosum, Bubroma Guazuma, Vilfa dulcis, Trifolium alexandrinum, &c. The chiguire, horse grass of Oroonoko. Spondias tuberosa and Zizyphus Joazeiro of Brazil.

Fruits, Aromatics, and edible Roots or Alimentary Plants.

Agathophyllum aromaticum, Araucaria Dombeyi and imbricata, Achras mammosa, sapota, and zapotilla, Amomum angustifolium, Areca oleracea, Anona palustris, sylvatica, senegaleniss, Sufu, Cherimolia,

* This is the Guinea grass, which is very extensively cultivated throughout Bengal.—H. H. S.

Aralia umbellifera, Amomum granaparadisii, Anisophylleia laurina, Acioa guianensis, Acacia esculenta, Aciotis discolor, Alibertia edulis, Amomum aromaticum, maximum, and Cardamomum, Artocarpus hirsuta, Chaplasha, and echinata, Alfonsia oleifera, Arum violaceum, Arracacha esculenta, Annesorrhiza capensis, Alpinia Cardamomum, Acer saccharinum, Argania Siderexylon, Ambellania acida, Aleurites ambinux, Alströmeria salsilla, Akar morai, and other Malayan fruits.

Bertholletia excelsa, Brosimum Alicastrum, Blakea trinernia, Berberis aristata and nepalensis, Bassia Parkii and butyracea, Brossæa coccinea, Baryosma Tongo, or Dipterix odorata.

Cinnamomum aromaticum, Codarium acutifolium, Chrysophyllum Cainito, Canna edulis, Comocladia integrifolia, Coccoloba uvifera, Chenopodium Quinoa, Cocos aculeata, Cecropia peltata, Carica cauliflora, Chrysobalanus Icaco, Couroupita guianensis, Crocus sativus, Calyptranthus aromatica, Chrysobalanus luteus, Conohoria Lobolobo, Cream fruit of Sierra Leone, Convolvulus edulis, Cocos butyracea, Chrysobalanus ellipticus, Carpodinus dulcis, Chrysophyllum macrophyllum, and obovatum, Cocos flexuosa, Camellia drupifera and oleifera, Celastrus edulis,

Catingha aromatica and moschata, Canarium commune and album, Caryocar nuciferum, Crudia aromatica, Caryocar amygdaliferum, and butyrosum, Cordyla africana.

Campomanesia lineatifolia, Cnestis monadelpha, Chrysophyllum acuminatum, Castanea indica, Cinnamomum nitidum, Cara root of Brazil, Cryptocarya Eanelilla, Corypha dulcis, Castanospermum australe, Cerasus occidentalis, Calyptranthes antiseptica, Capparis spinosa, Chrysophyllum microcarpum and Michino, and Macaucou, Couma guianensis, Chilgoza of Cabul, Chiga an Inga.

Durio zibethinus, Dolichos bulbosus and tuberosus, Detarium senegalensis, Diospyrus Kaki, Dioscorea globosa, atropurpurea, and fasciculata, Diospyrus Mabola, Drymis granaensis, var montana, Elæagnus dulcis, Elæis guineensis, Eulophia vera, Euterpe edulis, Eugenia Michelii, lineata, and gregii, Eugenia Pimenta, purpurea, cerasoides, and macrocarpa, Elæocarpus serratus, Erythroxylon Coca, Eugenia pseudo-psidium, Erioglossum edule, Elais melanococca, Eriobotrya japonica, Euphorbia balsamifera.

Flacourtia ramontchi, jangomas, and inermis, Fragaria grandiflora.

Geoffroya superba, Genipa americana, and meriana, Gouania domingensis, Grias cauliflora, Glaphyria nitida, Gnetum Gnemon, Galactodendron utile, Garcinia mangostana, Kydia, cornea and pedunculata, Guazuma ulmifolia, Galipea aromatica, Gomphia Japotapita, Gymnema lactiferum.

Hymenæa Courbaril, Hippocratea comosa, Hedycarpus malayanus, Habzelia aromatica, Hovenia dulcis.

Illicium anisatum, Inga fœculifera, and biglobosa, Ilex paraguensis, Inga sapida, Feuillei and vera, Jossinia mespiloides, and buxifolia, Inocarpus edulis, Inga dulcis, Jopoticabeiras of Brazil, Inga chiga of Humboldt.

Khaya Senegalensis.

Laurus cupularis, and Pucheri, Lecythis ollaria and zabucajo, Lansium domesticum, Laurus Quixos, cinnamomoides, dulcis, and calitlaban, Loreya arborescens, Ludia spinosa, Lardizabala biternata, Lucuma Caimito superior to mammosa, Lucuma Bonplandii, Laurus Persea.

Maranta arundinacea and nobilis, Melicocca bijuga, Malpighia glabra, and saccharina, Myrtus Pimenta and acris, Mammea Americana and Africana, Maclura aurantiaca, Myristica moschata, offici-

nalis, and otoba, Mimosa fagifolia, Malaguetta pepper, Monodora myristica, Myrtus cauliflora, and pedunculata, Myrica acris, Musanga nuts of the Gold Coast, Micadenia, or butter tree of Soudan, Mauritia vinifera, Makkah-nyeye of Timbey near Delagoa bay, Micrococcos palm, Myrcia pimentoides, and subcordata, Melodinus monogynus, Mespilus japonica, Mimusops Kaki, Milnea edulis, Mangifera oppositifolia, Mespilus Mexicana, Metroxylon viniferum, Mimusops dissecta, and imbricaria, Montabea Acostæ, Mauritia flexuosa, Myrica sapida.

Noronhia emarginata, Nutmeg and Cinnamon, Brazilian mentioned by Burchell.

Oxalis crenata, Ocymum tuberosum, Ocotea Pichurim, Oncus esculentus.

Parinarium excelsum, montanum, and macrophyllum, Psidium aromaticum, polycarpum, Cattleianum, Prunus occidentalis, Pentadesma butyracea, Parinarium campestre, Parkia africana and uniglobosa, Paullinia subrotunda. Podocarpus neriifolia, Poa abyssinica, Paropsia edulis, Pavia indica, Persica saligna, Pachylobus edulis, Paullinia Cupana, Pierardia dulcis and sapida, Piper anisatum, Phaseolus tuberosus, Prosopis horrida, dulcis, and Siliquastrum, Psidium guineense, Pentacrypta atro-

purpurea, Prosopis spicigera, Phœnix dactylifera, Psidium sapidissimum, Prosopis juliflora, Pinus Gingko, Peach palm of Humboldt.

Quadria heterophylla.

Raputia aromatica. Rhamnus inebrians.

Sarcocephalus esculentus, Spondias lutea, Mombin, purpurea, Myrobalanus, and dulcis, Sagus vinifera, Sterculia acuminata and chicha, Schmidelia edulis, Sapindus esculentus, Sechium edule, Sagus lævis, Safu of Africa, Scilla esculenta, Scytalia Rambutan, Sandoricum indicum, Scopolia aculeata, Sagus Rumphii. Saguerus Rumphii, Styloceras Kunthianum, Seje palm, Sphærocarya edulis.

Trophis americana, Tonsella pyriformis, Tropæolum tuberosum, Theophrasta Jussiæi, Triticum durum, Tabernæmontana, utilis, or Milk tree of Demerara, Theobroma Cacao, Telfairia pedata, Taxus nucifera.

Uvaria tripetaloides and aromatica, Unona æthiopica, Uvaria grandiflora, Unona undulata.

Vanilla aromatica, Voandezia subterranea, Virola sebifera.

Witheringia montana, Willughbeia edulis, martabanica.

Xylopia sericea, Xanthochymus dulcis.

Zanthoxylon piperitum, and aromaticum, Zizyphus Lotus, Zalacca Rumphii, Xanthophyllum aromaticum.

Otaheite gooseberry, Christophine, Jamaica Plum, Java Plum, Mountain Pear, Sugar Apple, Forbidden Fruit, Mountain Cabbage, Pois-doux tree. The Botanical names are not known to me.

The Pitanga, the Grumjama, the Cambuca of Brazil, Cereus Jamaracu. The Booroomma or Entoondo, resembling Cardamom in taste, and the Odica, or African Chocolate tree of Bowdich. The Butter tree of Ashantee, the Kolla nut, the Incheema, the Encruma and oxyglycus of Bowdich. Dracena terminalis. Tringo of Pearce, Cocos oleracea. The Manguaba of Brazil, Ficus Brassica, the Naras fruit of South Africa, the Oyty fruit of Brazil, the Cumapana root of Humboldt, Gonolobus hispidus, Salix Humboldtiana, Oxalis tuberosa, Ilex Paraguayensis, Alphanes Praga, Gregia aromatica, Thea oleosa, Psidium phylliroides, Madia Sativa, Alliaria and Arbor Sebi of Rumphius.

Inga bubalina, Acacia graveolens, Pangium, Cortex acris, Boa massy, Funis dentarius, Folium acidum minus, Saragan, Pomum Dræconum, Condondum malaccense, Atunus, Vidoricum, Mangostana

Celebica, Lignum vinosum, Malum aruanum, Tingulong, Blimbingum silvestre, Cortex oninius or sindoc of Rumphius, Cortex igneus.

Medicinal.

Abuta rufescens and candicans, Aristolochia serpentaria, fragrantissima, and odoratissima, Anchietea salutaris, Asclepias asthmatica, Andira inermis, Aromadendron elegans, Anda Braziliensis, Aristolochia ringens, and macroura, and anguicida, Altingia excelsa.*

Bonplandia trifoliata, Borreira ferruginea and Poaya, Berberis lycium, Bryonia epigœa, Brucea sumatrana, and antidysenterica, Balsamodendron opopalsamum, Bursera acuminata, Brayera anthelmintica, Gum Bassorah tree, Bignonia antisyphilitica, Byrsonima Moureila, Bubon Galbanum.

Colchicum autumnale, Convolvulus Scammonia and Jalapa, Cassia porturegalis, Copaifera officinalis, Canella alba, Croton elateria of Vera Cruz, Costus arabicus, Cratæva gynandra, Cocculus platyphyllus,

* Annals of Botany, vol. ii. p. 325.

cinerescens, and suberosus, Cissampelos ovalifolia, and Cerasus Capollim, Cassia marylandica, Copaifera ebracteata, multijuga, Croton Cascarilla, chloranthus officinalis, Coutaria speciosa.

Cephælis Ipecacuanha, Cornus florida, Coutoubea alba, Condaminea corymbosa, Cinchona lanceolata, lancifolia, oblongifolia, and cordifolia, Cassia occidentalis and falcata, Chimaphila maculata, Chlococca racemosa, Cocculus Fibruarea, and cripus, Cedrela febrifuga, Cinchona condaminea, Copaifera Langsdorffii, and coriacea, Chiococca anguifuga, Ceanothus azureus, Conoria cuspa, Cinchona pubescens, scrobiculata and magnifolia, and Condaminea, Casearia lingua, Curatella Copaiba, Cissampelos Pareira and glaberrima, Callicocca Ipecacuanha, Casca de Larangeira de Terra of Brazil, Cedrela Rosmarinus, Croton gratissimum, Cinchona ferruginea and Remijiana, Crotons (officinal) of Brazil, Cassine Gongonha, Cusparia febrifuga, Cinchona glandulifera.

Dorstenia Contrayerva and braziliensis, Davilla rugosa and elliptica, Drymis granatensis, Dryobalanops or Shorea camphorifera, Dorema ammoniacum, Drymis Winterii, Digitalis purpurea.

Exostemma caribæum, Euphorbia Ipecacuanha, Evodia febrifuga, Eucalyptus resinifera, Elaphrium

Jacquinianum, Echites antidysenterica, Esenbeckia febrifuga.

Feuillea cordifolia, Fraxinus rotundifolia, Fraxinus Ornus.

Guaiacum officinale and sanctum, Guarea Aubletii and trichilioides, Galipea officinalis or Angustura bark, Gillenia trifoliata, Glycyrrhiza glabra, Geniostoma febrifugum, Gomphrena officinalis.

Hypecoum pendulum, Hæmatoxylon campechianum, Humulus Lupulus, Humirium floribundum, Hortia Braziliana, Hyoscyamus niger.

Ipomœa Jalapa, Ionidium ipecacuanha, Poaya and Itubu, Isertia coccinia, Ionidium Marcucii, Inga salutaris, Ilex vomitoria, Ionidium calceolarium.

Krameria triandra.

Laurus globosa and caustica, Linum catherticum, Lisianthus pendulus, Laurus Sassafras and glandulifera, Laurus Camphorifera, and the Laurus of Oronoco and Guiana, mentioned by Burchell, Liriodendron tulipifera.

Melambo bark, Mikania guaco, Menispermum palmatum, Mimosa fagifolia, Manettia cordifolia, Mikania opifera and officinalis, Monnina polystachya, Myrospermum peruiferum, and toluiferum, Melaleuca cajaputi, Menispermum fenestratum, ver-

rucosum, and hirsutum, Myrrh tree, Myristica officinalis, Myrtus caryophyllata, Momordica elaterium.

Ocymum febrifugum, Ocotea Pichurim, Piper umbellatum, Panax quinquefolium, Pterocarpus erinaceus, and Draco, Pedilanthus tithymaloides, Phytolacca decandra, Polygonum hispidum, Piper Cubeba, Plumeria obtusifolia, Portlandia hexandra, Psychotria emetica, Polygala Poaya, Plumbago scandens, Potalia amara, Psychotria calicocca, Palicourea officinalis, Pæderia fœtida, Potalia resinifera, Petiveria tetrandra, Polygala Timoutou, Picrophlœus Javanensis, Quassia amara, Simarouba and excelsa.

Rondeletia febrifuga, Richardsonia rosea, brasiliana and scaber, Raiz preta of Brazil, Remijia ferruginea, Rheum palmatum, Rhus Metopium, and typhina.

Spigelia anthelmia, Styrax officinalis, Sida lanceolata, Simaruba versicolor, Strychnos pseudo-quina, Solanum pseudo-quina, Soulamea amara, Scilla maritima, Styrax Benzoin, Strychnos Ignatii, Smilax officinalis, syphilitica, medica, cumanensis, china, and macalucha, Shorea camphorifera, Smilax lanceofolia, Solanum paniculatum.

Ticorea febrifuga, Tachia Guianensis, Thalictrum majus, Tephrosia Senna, Trichosanthes cordata.

Uvaria febrifuga, Viola Ipecacuanha, Vandellia diffusa, Unona aromatica, and xylopioides.

Xanthoxylum caribæum, hiemale, and Clava Herculis, Xylopia sericea.

Paullinia africana, Momordica operculata, Brillantaisia owariensis, The Neoondoo tree of Bowdich, the Cusho, Shenna, Tumback, Indukduk, and Abbachugo roots of Pearce, Amyris Gileadensis.

Brachysanthes and Pseudostemma febrifugal of Brazil, Croton sanguifluum, Polypodium crassifolium, Laurus regia, Eucalyptus piperita, Amapaima, or Caska preciosa. Picrorrhiza Kurrooa, Chenopodium ambrosoides. Icica indica and Googul or Bdellium tree, the true Sarsa root of Oronoko, &c. Swietenia febrifuga Lasiostoma Curarè, Cerbera Tanghin, Antiaris toxicaria, Lycopodium catharticum, Ionidium parviflorum, Hiarry root of Demerara, a narcotic, Strychnos Tieute. Croton tiglium. Echites siphilitica, Lactaria salutaris of Rumphius, Arbor Toxicaria, or Upas, Malaparius. Lanius, of Rumphius, Paullinia sorbilis.

Ornamental.

Anthocleista macrophylla, Alfonsia amygdalina, Attalia amygdalina, Atropa arborescens, Afzelia Africana, Agave lurida, Aristolochia cordiflora, and labiosa, Achania Malaviscus, Anda Braziliensis, Angiopteris evecta, Acrostichum furcatum, Augustea lanceolata, Amaioua saccifera, Acrocomia sclerocarpa, Araucaria excelsa and imbricata, Acrostichum aureum, Alsodea physiphora, Aromatic grasses of Brazil, Aristolochia grandiflora, Astrocarya vulgare, Alpinia magnifica and malaccensis, Amaryllis principis, aulica, psittacina, solandraflora, and reticulata, Anneslea fragrans, Acacia niopo, Amherstia nobilis, Amyris Commiphora, nana, &c. Andersonia rohituka, Andirâ excelsa, Acacia Giraffe, Amaryllis vittata, Acaciâ esculenta, Amyris toxifera, ambrosiaca, and anisata, Agathis anthes Javanica, 120 feet high, Apocynum formosissimum, Aromadendron elegans, Apeiba echinata, &c. Amyris elata.

Banisteria fulgens, Bromelia lucida, Bignonia procera, Brunsfelsia violacea, Betula Bhojpatra, Bougainvillea braziliensis, Bignonia chrysantha, and venusta, and Telfairiæ, Bilbergia purpurea, and Barclaya,

Bauhinia porrecta, Bignonia leucoxylon, Brownea coccinea, rosea, and racemosa, Boottia cordata, Bentinckia Condapanna, Blackburnia monadelpha, Bauhinia racemosa, Brya ebenus, Broussonetia papyrifera, Bignonia echinata, Bombax ceiba.

Canna iridiflora, Cobea scandens, Cordia sebestana, Coutaria speciosa, Cedrela odorata, Combretum grandiflorum, Cassia moschata, Caladium arborescens. Cleome arborea, rosea, speciosissima and gigantea, Cratæva Tapia and fragrans, Cuphea multiflora, Cactus moniliferus, and melocactus, Capparis odoratissima, Crescentia Cujete, Carolinea princeps, and insignis, Chorisia speciosa, Cochlospermum insignis, Cyathea medullaris, Cecropia peltata, conchocarpus macrophyllus, Cereus serpentinus and ackermannii, Cerasus sphærocarpa, Caladium fragrantissimum.

Colvilleæ racemosa, Camellia chinensis, Casearia ramiflora, Couroupita guianensis, Crinum Broussonetii, and erythrophyllum, Calla aromatica, Calanthe veratrifolia, Crinum plicatum, Conanthera bifolia, Cactus cochinilifer, Cyrtopodium punctatum, Clianthus puniceus, Cæsalpinia bijuga, Citharexylum caudatum, Cocos fusiformis, Carolinea alba, Capparis Breynia, Chorisia insignis, Columbia serratifolia,

Cæsalpinia pluviosa, Caryophyllus antisepticus, Cactus peruvianus, Cucubrita moschata.

Cremanium theezans, Curcuma Roscoeana, Castanea malayana and martabanica, Corypha elata and Taliera, Cerbera fruticosa, Calla aromatica, Chaulmoogra odorata, Calyptrion all the species, Croton suavis, Convolvulus superbus, Calochortus macrocarpus, Crinum giganteum and Yuccoides, Cassia caryophyllata, Carapa guineesis, Campomanesia lineatifolia, Cocos aculeata, Cheirostemon platanoides, 15 feet in diameter at trunk, Columbia javanica, Clusia rosea, and alba, Chrysopia fasciculata, Caryocar amygdaliferum, 240 feet high, Cavanillesia mocondo, 8 feet in diameter, Cyathea speciosa, and excelsa, Chiga, Inga.

Diospyros obtusifolia, Dichorisandra thyrsiflora, Dioscorea Braziliensis, Dolichos roseus, Dalea citriodora, Duhamelia chrysantha, Delechampia braziliensis, Datura ceratocaulon, Doryanthes excelsa, Dodonæa salicifolia, Dalrymplea pomifera, Dalechampia fimbriata, Dracæna Draco.

Epicharis altissima, 140 feet high, Erythrochiton braziliensis, Engelhardtia Wallichiana, Erythrina speciosa, crista galli, and picta, Eugenia guyanensis, Eucalyptus albens, Erythrophleum guineensis, Embothrium speciosissimum, Euphorbia punicea, Eu-

patorium Dalea, Entada Gigalobium,* Eugenia triflora, inocarpa and balsamica, Evosmia caripensis, Eugenia lancefolia, Elæocarpus ganitrus, and tuberculatus, Erythrina monosperma, Eugenia Michelii, and lineata, Eryngium aromaticum, Erythroxylon areolatum, Erisma floribundum, Esenbeckia altissima, 120 feet, Elæocarpus macrophyllus, Evodia hortensis, Eriolithis mirabilis.

Ferdinandusia speciosa, Fredericia speciosa, Furcroea gigantea, and tuberosa, Ficus sycamorus, Franciscea Hopeana, Flindersea amboinensis, Fagræa fragrans, Ficus macrophylla, Fritillaria barbata, Fuchsia arborea, Ficus gigantea, nymphæfolia.

Geoffroya superba, Gustavia pterocarpa, Guatteria ouregou, Guarea trichilioides, Gaura fruticosa, Gonolobus diadematus, Gesnera bulbosa, Geoffroya Inermis, Galinsogea trilobata, Guettarda coccinea, Geonoma palm, Geoffroya racemosa and violacea, Geonoma pinnatifrons, Gronovia scandens, Gonolobus hispidus, Goethia semperflorens, Glaphyra nitida; Ginoria Americana, Gardenia campanulata, Gonohoria lobolobo, Gloxinia speciosa, Gaultheria odorata, Gynerium sacharoides.

* This powerful Climber is a native of every part of continental India.—H. H. S.

Heliconià psittacorum, and bihai, Haemanthus multiflorus, Heliocarpus Americana, Hedera aromatica and umbellata, Heteropteris chrysophylla, Humea elata, Hernandiea ovifera, Hedyosmum hirsutum, Hopea odorata, Hura crepitans.

Inga biglobosa, Jacaranda ovalifolia, Jubœa spectabilis, Ipomœa Krusensternii, Jatropha integerrima, Ismene Calathina, Ipomœa glandulifera, Inga mellifera, Jackia ornata, Intsia Amboinensis, Jackia excelsa.

Kielmeyera speciosa, Kunthià montana.

Lobelia splendens and fulgens, Lantana pseudothea, Lecythis ollariá, Limnocharis Humboldtii, Lodoicea Sechellarum, Lafœensia speciosa, and acuminata, Liriodendron grandiflora, Lilium tigrinum, Lachnostoma tigrinum, Lacepedia insignis, Lantana violacea, Latania rubra.

Manicaria saccifera, Marica northiana, Mirabilis longiflora, Myrica Mexicana, Mauritia flexuosa, Mayna Braziliensis, Melastoma tomentosa, Myrtus splendens, Maccaubu palm, Myrrhinium atropurpureum, Mauritia aculeata, and vinifera, Metrosideros vera, Maranta Zebrina, Montezuma speciosissima, Marcgravia umbellata, Mimosa ceratonia, Melastoma aromatica, Myrtus ugni, Myrianthus

arborea, Myrica subcordata, Millingtonia simplicifolia, Mangifera macrocarpa, Mucuna urens, Manglietia glauca, Magnolia Coco, Moronobea coccinea, Maprounea braziliensis.

Norantea guianensis, Nauclea undulata, macrophylla, and purpurea, Nepenthes distillatoria.

Ormosia dasycarpa, and coccinea, Oxyanthus speciosus, Omphalea triandra, Oreodoxa regia, Oenocarpus Batana, Ornithogalum corymbosum, and arabicum, Opuntia braziliensis, Ottonia anisatum, Ochroma Lagopus, Oreocallis grandiflora, Omphalocarpum procerum.

Podocarpus macrophylla, Plumeria tricolor, Portlandia grandiflora, Pergularia sanguinolenta, Pancratium Amancaes, and pediale, Picramnia Antidesma, Petrea volubilis, Passiflora Murucuja, Parivoa grandiflora, Piscidia Erythrinà, Phaseolus multiflorus, Panax aromatica, Parkia Africana, Paullinia Cururu, Pothos digitata, Piper umbellatum, Palicourea speciosa, Pistacia oleosa, Petunia viloacea, Prunus occidentalis, Passiflora kermesina and racemosa, Pontederia azurea, Piper anisatum and inebrians, and methysticum, Philagonia procera, Poinciana regia, Peristeria pendula, Poinsettia pulcherrima, Pancratium caribaeum, Psidium aromaticum, Po-

soqueria longiflora, Phytocrene gigantea, Pancratium amboinense, Papyrus odorata, Petiveria alliacea, Prosopis pallida, Pachyloma coriaceum, Platanus orientalis, Panax Anisum.

Robinia violacea, Russelia multiflora, Rondeletia loniceroides, Rhododendron arboreum, hispidum, and lepidotum, Rhexia Princeps, and grandiflora, Randia Bowiana, Rhodochiton volubilis, Rhododendron puniceum, Roydsia suaveolens, Rhinocarpus excelsa, 140 feet high, Rejoua aurantiaca.

Scoparia dulcis, Solandra grandiflora, Sanseviera guineensis, Schinus Molle, Schotia speciosa, Securidaca volubilis, Sagus vinifera, Sterculia Chicka Sphærosacme spectabilis, Stifta chrysantha, Solena grandiflora, Spiloma roseum, Scilla esculenta, Sanseviera longiflora, Spiranthera odoratissima, Swartzia grandiflora, and myrtifolia, Sterculia alata, Sciuris aromatica, Styrax tinifolia, Singana guainensis, Spathodea gigantea.

Trichilia odorata, and moschata, Tillandsia usneoides, Tropaeolum majus, and tuberosum, Tetracera potatorum, Treveriana coccinea, Tacsonia adulterina, Theophrasta longifolia, Trichopteris excelsa, Tetracera jamaicensis, Thespesia grandiflora, Terminalia procera, and citrina, Telopea speciosissima, Tibou-

china aspera, Trixis neriifolia, Tovomita fructipendula, Tripinnaria africana, fruit size of a man's head, Tanæcium Jaroba.

Uncaria guianensis, and insignis, Gambir and acida, Unona latifolia.

Vismia guianensis, Violariæ of Brazil, shrubby genera, Vitis caribæa, Victoria regalis.

Wittelsbachia insignis, Wrightia caryotoides.

Xylopia glabra, frutescens, and sericea, Xanthophyllum virens, Xylophylla latifolia, Xylocarpus granatum.

Yucca superba.

Zanthoxylon alatum, piperitum, and emarginatum, Zamang mimosa of Humboldt.

The Tulip tree of Bowdich, the Kolquall of Salt, the Amaryllis of Salt, the Berberrer Fishpoison tree, and the Lion poison tree, called Merquotsar, of Pearce, the Darro tree of Abyssinia. The Cactus of the Gallipagos Islands, 50 feet high, Holboellia latifolia, Trewia nudiflora, Bignonia orbiculata, Aubleta tiburba, Tabernamontana macrocapa, Cornidia integerrima, Echites coccinea, Pentaloba zeylanica, Triplarisamericana, Nepenthes Rafflesiana, Talauma braziliana, Rhododendron javanicum, Euryale ferox, Agave americana, Humboldtia laurifolia.

Wallichia spectabilis, Wightia gigantea, Gustavia augusta, Chilocarpus suaveolens, Eucalyptus alba, Melaleuca viridiflora, Laurus chloroxylon, Leptospermum amboinensis, Sarcolobus globosus, The Vadgaior Cucurito palm.

Impatiens Walkeri, Ailanthus moluccana, Panax pinnatum, Fructus musculiformis, Funis muræna-rum latifolius, Manga fœtida, Lansium montanum, Olus album, Folium acidum majus, Pulassarius, Lignum clavarum, Arbor versicolor, Corallaria latifolia.

Aralia umbraculifera, Uvaria odorata, Unona ligularis, Cananga sylvestris, Arbor Violaria, Lingoum and L. saxatile, Gelala, Lactaria salutaris, Pauw, Alyxia stellata, Arbor nussalavica, Caju Galedupa, Pharmacum Sagueri, Catti marus, Restiaria alba, Hernandia ovigera, Folium intinctus, Ailanthus moluccana, Ichthyochtones montana and Folium urens, of Rumph.

Strophanthus hispida, Plumeria pudica, the Jagua palms of Humboldt, Lanpujum Rumphii, Trichosanthes heteroclita, Myrtus brazíliensis, Astrocaryum vulgare, Silk palm of Humboldt, Patagonian Tamarind of Dupuis, Stadmannia Sidoroxylon, Eugenia Plinii, Gagnebina tamariscina, Inga spuria, Combretum laxum, Buttress tree, Brasil. Napoleona imperialis.

From DR. GIBSON, *Superintendent of the Botanic Garden at Dapooree, to* DR. SPRY, *Secretary to the Agricultural and Horticultural Society of India, dated 13th February,* 1841.

I have now the pleasure to return the proof sheets of my own remarks and those of Dr. Burn. As Dr. B. is in Europe, Dr. Browne sent two proofs to me for correction. Since the date of my remarks, the overland communication has enabled me to do a good deal in the way of extending the variety of products.

I have now many Pines (Firs) of different sorts potted; one, now three years old, in our ground grows slowly; but it is healthy. The medical stores are now supplied with Extract Hyoscyami made at this garden, and from January next I am to have the contract for Senna leaves. The kind produced is from Tinnivelly seed, and it has been, on trials made at Bombay, pronounced equal to the best Arabian Senna.

We have in this district this year about 100 acres of Mauritius Sugar Cane, grown chiefly to supply the demands of the Sugar manufactory close by, and partly grown on private account. From

what I see now, I feel convinced that government rather retarded than advanced the introduction of this Cane, by allowing it to be grown rent-free.

The ryots, naturally suspicious, deemed the exemption to arise from secret views on the part of government as to the future taxation; and in this idea they were the more confirmed, by having the plants given *gratis*. Now that they have to pay tax, and also for plants when wanted, there are not a few purchasers.

I am sorry to say that the wheat altogether failed.* In fact water had got into the canisters on their way round. The Dacca Cotton seed which I received from you I chiefly sent to Mr. Elphinstone, Collector of Rutenagherry. I saw it growing in his plantations in November last; but few seeds only had come up. I have reserved some to sow with the first of the rains, and shall let you know the result.

I have now the Conium † maculatum growing

* Dr. Gibson here alludes to a supply of English wheat, which was sent to him for trial by the Agricultural and Horticultural Society of India.—H. H. S.

† Seeds or plants of this and the Momordica Elaterium would be very welcome to the Society, as well as to the H. C. Bot. Garden at Calcutta. —H. H. S.

here; also two plants of Momordica Elaterium, the latter from Mediterranean seed; also Spartium, Schinus Múlli, and some other exotics. The Olive plants appear to grow well at this elevation, which is about 1900 above the sea.

It remains to be seen whether the fruit, in case it be produced, will be of any value.

Western India.—*(Continued.)*

From DR. BURN *at Kaira, in Guzerat, to* DR. BROWNE, *Private Secretary to the Honorable the Governor of Bombay, dated 12th December*, 1839.

I have much pleasure in replying to your letter of the 25th November, and shall willingly afford all the aid I can for your reply to the queries of the Agricultural and Horticultural Society of Bengal. It is little that I can do in the way of giving you any thing new; I would incline rather to notice things that are well known, but which can be IMPROVED; and others, which though known to exist, are as yet turned to no use.

The arrangement or classification pointed out by the Society, appears to me complex, and I cannot at present collect my ideas accordingly; but I will endeavour to follow it as closely as possible. To explain, I have a very great deal to do at present, this being the season when agricultural pursuits can be best examined practically, and as I am about to take advantage of furlough in February, I wish to wind up as it were all the little affairs connected with the experiments on silk culture, cotton, &c. which I have been engaged on during the last three years.

Of esculent grains, Gujerat produces a large variety. Some grow in a wild and natural state, others, according to circumstances which proceed from different sources, require a greater or a less degree of care under cultivation. Naturally, the climate and soil are admirably suited for the production of esculent grains, for the simple process of covering in the seed by the bamboo drill, in use from time immemorial, is all that is requisite to obtain a tolerable crop.

In some parts to the north of this I am informed that the soil is never ploughed, and yet it yields annually crops of wheat; the seed being sown by the drill, and then a large bunch of thorns drawn

over the field to smooth it. *But were the Ryots able to plough and manure their lands properly,* the produce, generally speaking, of every field might be double, and thus one-half the land now cultivated might be employed for other produce. What can be expected from wooden ploughs and starved bullocks, the drivers of which know well that whatever exertion they may bestow, benefits them not, further than that any how they obtain a bellyful. All surplus goes to the Sircar;* or the Polemical Priesthood—the Brahmins—the scourge of India, find means by working on their credulity to deprive them of every rupee which they happen to save!!

Rice and bajri, are consumed by the higher or richer classes, together with four or five kinds of pulse. Of inferior grains a great number exist, but none appear of value as articles of food. The codra is remarkable as causing all the symptoms of diseases induced by some of the most powerful narcotic poisons; this only happens I believe when the grain has been kept for seven or eight years, and I may remark, the mustard emetic in such cases has the most beneficial effect.

* Government.

Several kinds of grass seeds are collected by the low caste natives during the monsoon in large quantity, and with great ingenuity, by means of a basket swept along over the tops of the grass; a single man in one day will collect as much as he can carry home at evening. These grasses grow wild in the "beers," or wherever the ground is uncultivated, and spring up in July with the first fall of rain; they are ripe in less than two months, and then thousands feed upon them who could, at that period, find no other means of subsistence. Of these "Sawa," a kind of millet, and "Numar," wild rice, are the chief.

Oats and rye are the only cereal grains not cultivated here, and I suppose the temperature of the atmosphere seldom descends low enough to admit of attention to them. Frost seldom happens in Gujerat.

Barley is one of the cheapest grains to be found in the Bazars; the people have a prejudice against its use; they say a man loses strength by feeding on it; and they object to give it to their horses and cattle: all my experience goes to prove that the prejudice is unfounded. I have fed my horses on it, and I have seen it used by many of the poor fami-

lies about Kaira, without producing any but the best effects.

Great variety of food is well known to be essential to the health of a people using little of animal produce; so in Gujerat we find great attention is paid to the culture of leguminous esculents, but they are also known to contain a large portion of matter analogous to animal substances, and therefore to the hard-working labourer, they become an essential article of food; milk and ghee are generally beyond his reach, unless in small quantity. These leguminous field plants are the same as are found in other parts of India. The prices of these grains would afford a fairer proof of the productiveness of any season in Gujerat than any others, but that of milk and ghee would afford the best average state of the markets.

Medical Plants.

Of these there are a large number; to notice those used by the natives would be useless, though many of them are, I believe, very useful. We have here

some of the most valuable to be found in our own Materia Medica, of which the government cannot fail to know, but until they are thought worth collecting, of what value can it be to add to the list?

Colocynth, of two kinds, abounds here—the true Cucumis Colocynthis and C. Pseudo colocynthis. I have made extract from the former, quite equal to that obtained from the Levant apple. In those severe cases of Fever, common in Gujerat, where the torpid state of the peristaltic motion of the bowels is difficult to overcome or to rouse, I have found this extract very useful.

Senna, the two kinds used in medicine—Cassia lanceolata and obovata—I have elsewhere described as existing in Gujerat. I find they may be cultivated with the greatest facility; my gardeners are now picking the leaves from about four beegas, sown about the middle of August. The seed was drilled into the ground, and the only attention required by the plant, is loosening the ground, and weeding two or three times when it is young.

The art practised for preserving the purgative property in the leaves I was not aware of, till by accident I found on inquiry that some that I had sent to Bombay had been pronounced by Dr. McLennan to

be no better than chopped hay. The time of gathering in this instance was the sole cause of fault. I mention this to show, that in all cases of experiment, both the favourable and adverse circumstances should always be impartially stated. Had this fact not come to my knowledge, I might possibly to this day have gone on blundering. I feel convinced, however, that there are still some little points in its cultivation which I am not yet acquainted with sufficiently, and which add to the strength of the leaf; my senna is remarkably mild, and not so strong as the Tennivelly or Egyptian; still the botanical characters of the plant I believe are identical.

Glycyrrhiza glabra ?*
Momordica Elaterium†
Aloe spicata ?
Dolichos pruriens, &c. &c.

grow in considerable abundance; the roots and seeds of the Nymphœa Lotus; the fruit of the Trapa bispinosa; the roots of the Scirpus palustris‡ are used by the natives as articles of luxury

* Drs. Gibson and Wallich suspect that there must be a mistake here.

† Dr. Gibson states that active Luffas are found.

‡ Dr. Wallich supposes some other plant of the family of Cyperadeæ is meant than Scirpus palustris.

in the fruit way. Gardens are not common in Gujerat; any fruit, save the common plantains, the guava, and the sweet limes, is seldom obtainable; the vine flourishes with difficulty; mangoes abound, but are seldom good; the fruit of several wild plants is eaten, as the Ziziphus jujuba, Feronia Elephantum, Eugenia Jambos, Ægle Marmelos, Mimusops hexandra, &c. &c. Carrots, radishes, bengins, (Egg plant), onions, and a great variety of green herbs, chopped up with ghee, salt, and red pepper are eaten under the name of *ophagee;* they have no turnip, and very few sweet potatoes, or yams; nor do they ever use the love apples, (Tomatas.) A great variety of cucurbitaceous plants are cultivated, and their fruit is always in great demand. Boota, or Indian corn, is grown by the gardener castes, but it is only used when green, the production of flour from this grain would be too expensive, as it requires the best soil, and a quantity of manure.

Fodder, &c.

The natural grasses afford abundance of excellent fodder; no care is taken in their cultivation save to

cut them down with the sickle when ripe, and to tie them into small bundles of a couple of handfuls each. The natives name at least a dozen, and ascribe qualities to each as they consider them more or less nourishing, &c. Huryallee, (Panicum?)—is one of the most valuable when cut green, or made into hay. In an ordinary season as much hay may be had for two and a half rupees, as will feed a horse for a month. But even at this cheap rate it is too expensive for the Ryots, who feed their cattle on the sweet stalks of the two common millets—joari and bajri; still I believe they are better suited than grass, particularly the joari, as fodder for oxen.

There can be little doubt that it is more nourishing; on it the cattle of the Ryot live, and work too, and in nine cases out of ten, *never receive any grain;* the straw of a great variety of pulse is given occasionally to whet the appetite, and when very hard worked, they receive a little bajri itself and mutt, or mug, or gowar.* Cattle are very fond of these three pulse grains, and the strength and

* The Dolichos fabæformis (now Cyamopsis psoraleoides) see Jones' Mahratta Dictionary, and Graham's and Nimmo's Catalogue of Plants of Western India.—H. H. S.

plumpness they attain when fed on them is no less remarkable; a little salt is daily given along with them, and is essentially necessary to the health of oxen, whatever may be nature of the food given them. Hence the poor Ryot feels heavily the tax upon this article. Until an improved system of agriculture shall be found necessary by the Government, I think the present wants of the people are amply supplied as regards fodder.* Guinea grass, lucern, and Egyptian clover, all grow very well here; but would not repay the *Ryot* for the labour and expense of culture, so long as other fodder is so cheap.

* A gentleman who has resided many years in Guzerat, in a high official situation, and who has had an opportunity of seeing a proof of this part of Dr. Burns' communication while passing through the press, informs me, that he does not agree with Dr. Burns in thinking, that the wants of the people are supplied as far as regards Fodder. He says, "Had he (Dr. Burns) been in Goojraut in 1833-4, when a drought was followed by locusts, he would have written differently. That province is afflicted by drought about every eight years, and there such crops as Guinea Grass and Lucerne would be invaluable. Every cultivator in Kaira, where Dr. Burns, I think, is stationed, has a well; but the cattle die off so quickly *for want of fodder* in such a season, that they can hardly get enough to work their wells."—H. H. S.

Manufacturing and Commercial Articles, Oils, &c. &c. Staples of Commerce, Trees, &c.

This head contains so much, I have not time to enter on any thing except a very few things, and I shall keep my eye to staples, or what ought to be such.

Tobacco is the chief exportable produce of this zilla; from Nerriad large quantities are annually sent to Upper India, viâ Malwa. The experiment of curing for the Europe market, has never been attempted; but by a practical hand, I think it might be rendered a useful article.

Safflower, from the flowers of the Carthamus tinctorius, is prepared for colouring the turbans of the people, and as the plant grows most luxuriantly, it might be rendered a valuable article of export to Europe.

Senna might be cultivated to supply both India and Britain, at as cheap a rate as from any other place.

Colocynth—of this the same may be said as of Senna; it is to be had wild from the jungle in cart loads.

Cantharides ditto, ditto, and several other medical products.

Gum Arabic, from the Babul, Acacia arabica.

This tree may well be considered as one of the most valuable, I believe; and in the numerous uses to which its various parts are applicable, second only to the Cocos nucifera; without it what would our Ryots do to supply themselves with Agricultural implements? Of this wood all the cart wheels in Gujerat are constructed, and put together without a single iron nail, and yet they endure for five or six years; common salt is the substitute for nails. By an ingenious process the wheel when finished is salted, and by the deliquescent property of the salt rendered proof against the dry atmosphere of the hot season.

The bark of the Babul is the most useful of all for curing leather; without it leather bags and ropes, used by the Ryots, and called the coop, could not be cured. The leaves and young branches form valuable food for goats and sheep; the pods are collected and sold at a high price as nourishing food for milch buffaloes; the wood forms the best charcoal and fire-wood.

This tree ought certainly to be protected, and the government could not do better than order a plantation of it to be attached to every village in the country. The expence would be little, and it would

repay in a thousand different ways; the saving manures for the fields by preventing the burning of cow-dung, as is now the case, and which a good supply of fire-wood might prevent, should of itself render the subject worth the consideration of government. But I must stop; enough has been said on the Babul, only let me add a most important point, which is to know how to render the seed capable of germinating; there are two ways; first and best,—collect that which has been *vomited by goats or sheep;* it may be had in a large quantity in the places where they lodge at night, during the season the seed ripens;—second, *boil* the seed for *two or three* minutes in water. Treated in this way the seed rapidly grows to a large tree; it thrives in Gujerat even better than in the Dekun. It is not to this species, Lalla Rookh alludes, when he says—

"Our rocks are rough; but smiling there,
"The Acacia waves her *yellow hair*, lonely and
"SWEET; nor loved the less, for flowering in a wilderness."

Sugar cane is not very extensively cultivated. The Mauritius kind was introduced here, and last year there were, I believe, upwards of a hundred

beegas cultivated in the Zillah, but this year the whole cultivation is said to be less than three beegas !!—The famous order of the Court reimposing the begoti, is the cause of this. Remark—all sudden changes are bad!

Silk.—The culture of the mulberry, and the introduction of the art of rearing silk worms through Gujerat, I offered to government to undertake about three years since, and so far as I have gone, success has been ample, and most encouraging. But the allowances granted (Rs. 76 : 8 : 0) are so small, that the scale on which my experiment has been conducted has been very limited. The thing, however, has taken root, and tree after tree is being planted by the Ryots, so that some fifty years hence, Gujerat may be able to export silk.

Very little cotton is produced in this Zilla, and none of it is grown as an annual, but as a perennial, although the species is the same as that cultivated at Baroach. The difference in the nature of the two soils is the cause of this. Our soil is well adapted to the black seed cottons; and from experiments conducted here during three years, I find that by proper management, a very superior cotton may be produced, *under proper training*; neither will

there be diminution in the size of pods, nor shortening of the staple; indeed I am inclined to think that cotton very little inferior to Egyptian might be produced through the greater part of this Zilla. In my garden there are some plants of Egyptian cotton, loaded with pods nearly ripe; it requires irrigation, however, and would therefore cost more to rear it than the kind above alluded to. But then why should not the old water-courses for irrigation from the rivers Mhye and Sambarmutti be opened up? Let the government do this work handsomely, and on a proper scale, and success is certain to follow. The resemblance in the soil and climate of Egypt and Gujerat are not the only striking features that would lead one to believe that the plants of the one country would grow well in the other, and *vice versa;* the vegetation is in many points identical, and in some instances what does not thrive in Egypt, does not succeed in Gujerat!

Oil of various kinds, but chiefly that of the Sesamum Orientale is produced; it is eaten and used for burning. Castor oil also is produced in large quantity for burning, and used largely by calico printers. Neem tree seeds afford a very clear bitter oil used for burning.

Bassia latifolia, the seeds are collected for the oil.

Carthamis Tinctorius, seeds yield oil, &c. &c.

Hemp, both Crotalaria juncea and Hibiscus cannabinus, are cultivated as cordage plants only.

I know of no Tanning substances in use here but the bark of the Babul, also that of the Cassia auriculata, and the milky juice of the Asclepias gigantea; the milk is collected early in the morning by breaking the leaves, and allowing it to drop into an old buffalo horn.

We want in Gujerat—

The Olive, Olea europæa.

Mulberry trees of every variety.

Date Palm of Egypt.

Senna seed, Alexandrian.

Coffee trees, or plants, *not seeds.*

Balsam tree of Arabia.

Trees yielding Myrrh and Frankincense.

Arundo Bambos, different varieties, to cultivate for the use of the Silk-worm establishment; they are very expensive here.

To get government to introduce the culture of the Betle nut, *and leaf*, the Paun, north of the Mhye.

Baroda supplies the whole country up as far as beyond Deesa, and the revenue realized must be

very large. The pungent leaf of the Piper Betle is a highly valuable condiment for the natives.

Indian rubber tree, Ficus elastica.

Arrowroot plants.

Allspice tree.

Quassia tree.

Palm oil tree, Elæis guineensis.

Gum Copal, &c. &c. &c.

Cassava plants have been introduced by me, brought from Bombay, and the plant grows admirably.

Convolvulus Scammonia wanted.

Egyptian wheat

Carob tree, a native of Syria, the seeds.*

There is nothing Gujerat can give to other parts of India or to England, but to Egypt we could give

* The introduction of the Carob tree (Ceratonia Siliqua) at the Government Garden at Saharunpore, has been very successful. The Superintendent in his report to Government for the past year, 1840, (see Proceedings of the Agricultural and Horticultural Society of India, for May 1841,) states, that several hundred plants have been raised, and will be distributed eventually along the dry and sandy tracts of the North-western Provinces, where they will constitute a valuable boon to the inhabitants, and shew the estimation in which it is held. He further mentions, that the pods sell in the bazar at ten rupees a seer, or five rupees a pound.—H. H. S.

various useful seeds and plants,—as the neem tree, the mowra tree, the kerui tree,—all of which produce the most valuable timber, and the seeds yield oil: also various grasses, pulses, &c.

I fear I have but imperfectly performed the work you required. The more I write, the more I find I have to write. However, any specific question you may require can be answered any time, and no one can be found more willing than I am to aid in the good work.

From Dr. GIBSON, *Superintendent Botanic Garden at Dapooree, to Dr.* BROWNE, *Private Secretary to the Honorable the Governor of Bombay, dated 19th Feb.* 1840.

Food—comprising Esculent Grains of all kinds—Medical Plants, Fruits, and Roots.

Of the grains most commonly in use, several varieties of the finer kinds of rice might be advantageously naturalized in some of the Tropical Colonies of Great Britain—such as the Kumode and Ambi-mohr varieties.

Of dry esculent grains—

1st. Wheat—Of this there are four varieties reducible to three species.

The first of these, the Bukhshee wheat, is a grain of a superior quality to most of the common wheats of Europe.

2nd. The Daood Khanee is (as its name imports) probably a Persian or Tartarian wheat, naturalized by the Musulmans.

3rd. We have also a beardless wheat similar to the English.

I shall be happy to forward specimens of all these for trial in England; and I would in return, gladly

receive a few pounds of Polish wheat. Of the latter a specimen was sent me, and the cultivators of an extensive wheat district were most anxious to procure a supply of it for seed. From the appearance of the grain, they calculated that it would be likely to produce a return half greater than that of the common field wheat. The specimen unfortunately did not vegetate. A small parcel sent by the Overland route, would be more likely to succeed.

The Talavera wheat, I succeeded in raising from Havanna seed.

It seemed a poor and red grain as compared to the best wheats of this country.

The Bajri (Holcus spicatus) common in these provinces, being a productive and rather hardy grain, well fitted for the food of man and of animals, could probably be easily naturalized in Australia.

The Toor, or Cytisus Cajan, if not already cultivated in Southern Europe, would succeed well there, as also in Australia. In the West Indies, it has long been pretty extensively cultivated. As to the introduction of any of the Cereal or Leguminous grains from Europe to India, I think that little can be done.

The Oat grows well in some parts of the Bombay presidency, as above the Ghauts, and yields a very productive crop; but the grain is comparatively husky and worthless, and in my humble opinion very inferior as a food for horses to the grain of this country.*

As to the possibility of acclimatizing any of our Indian oil plants in England, I am not sanguine. Their success in some of our West India Colonies would be more certain; but in the latter, the quantity of land which could at present be devoted to their culture is so small as to render their introduction hardly an object.

The number of esculent grains in India, fitted for the food of man and of beast is so large, and their quality generally so excellent, that we ought rather to look to the extension of the means of our cultivation, than to seek to increase the number of grains.

The number and variety of the melon, cucumber, and gourd tribe, adapted for the food of man, is very large; and besides these there are many kinds

* In some districts of Bengal it is cultivated rather extensively, and is rapidly increasing to meet the demand of the Calcutta market.—H. H. S.

of tuberous roots, as the arum, the sweet potatoe, &c. which are within the means of the poorest people.

The Potatoe (Solanum tuberosum) may be considered as naturalized, and is in many situations produced of an excellent quality.

The Tapioca plant has been lately introduced, and in situations near the Coast, gives, by all accounts, a very large return.*

Its success in the Deckan is more doubtful. The size which the root attains in twelve months does not appear such as to render it probable, that in the Deckan it can compete with the potatoe or sweet potatoe. The result of the trials of tapioca made in Gujerat, I have not yet learned. Should the climate suit the plants, the returns will probably be even larger than is the case in the Concan.

As to the medicinal plants which might be introduced from Europe or America into India, the number is considerable, and some of the desiderata are of great value.

* Both tapioca and arrowroot have, within the last two years, been very extensively grown at Allipore, one of the suburbs of Calcutta, for manufacturing purposes. As much as thirty tons of the latter was prepared during the present year (1841), and of first rate quality.—H.H.S.

I may enumerate the—

Peruvian bark tree,
Gum guiacum tree,*
Quassia tree,
Logwood tree,
Copaiva balsam tree,
Tolu balsam tree,
Sarsaparilla,
} Tropical America and the West Indies.

Ipecacuanha Plant, and the Jalap Convolvulus.

The acquisition of all or of any of these would be most desirable.

That there exist, between Cape Comorin and the Himalya, localities suited to many, if not to all, of them, is hardly to be doubted.

Probably the mountain valleys and jungles in Malabar, Wynaad, or Coorg, assimilate in climate to many of the countries where they at present grow, and it would be of the utmost importance that they should be conveyed direct from their native soil to the situations intended for them in India.

* We have in the Calcutta Botanic Garden the Guajac, Quassia, Sarsaparilla, and Manettia cordifolia, (one of the Ipecacuanha plants); all of which may be expected to become naturalized in those parts of India more suited to them than Lower Bengal. The Logwood is very extensively cultivated as an ornamental shrub.—H. H. S.

From the Mediterranean countries, the following might with advantage be imported:—

1st. Black Hellebore plant,—Bazar Syn. "Kalee Kootkie." The Bazar Hellebore comes I believe from Persia; it is seldom found sufficiently fresh to allow of its being depended on as an active medicinal agent.

2nd. The Scammony convolvulus.

3rd. Liquorice root plant, and few others of lesser note.

The number of medicinal plants which could be supplied by us from this quarter of India, for naturalization in the West Indies, and some other of the Colonies of England, is not large. Some of the Polygonums.

Solanums,
Crotons,
Cannabis sativa,
Vernonia anthelmintica,
Xanthochymus,
Ægle Marmelos,
Anacardium orientale,*
Calotropis gigantea,
Sapindus emarginata,
Zyziphus Jujuba,

* Sic in MS. Query *occidentale*.—H. H. S.

seem to me to comprise most of those peculiar to this part of India, and which might be worth the trouble of naturalization in a foreign colony.

Of fruit trees capable of being naturalized in India, the number already introduced from the West Indies, Tropical America, and other countries, is considerable. Amateur Horticulturists have led the way in this branch, and in their hands it may probably most safely be left.

Several of the better sorts of China fruits are, I believe, now grown in Bombay, as the Litchi, &c.

The gardens at Parell and at Dapoorie can boast of the Blighia sapida of New Zealand, now producing fruit (at least at Dapoorie) annually. The Achras Sapota flourishes well at Dapoorie. The Avocado pear has been introduced into Bombay from the West Indies, and also into the Deckan by the late Major Ford. One tree exists at Dapoorie.

The apple, plum, pear, and quince have been naturalized to a degree probably as great as the nature of the climate will admit of. The first of these attains some size in the higher level of Ahmednuggur, but is not such as to be worthy of a rank with either English or tropical fruits.

The pear and plum do not, to the best of my knowledge, ever ripen.

The apricot blossoms abundantly at the level of Poonah, but does not produce fruit.

Fodder and food for Cattle and Animals—grasses, seeds, fruits, roots, and leaves—also Ornamental plants.

The trials made of the grasses and fodder plants of Europe, have generally not had an encouraging result. Italian Rye grass I have raised from seed; but it remains comparatively sickly and stunted.

The Maltese Trefoil, a Legume celebrated in southern Europe for its productiveness and its adaptation to the food of cattle, gives in the Deckan no promise of a return. Lucerne has been successfully acclimated, and is now largely cultivated by natives chiefly for sale to the European community. Its use also is spreading among the cultivators for their own cattle.

Guinea grass;—of this the introduction is more recent. It yields a slower return than Lucerne,

but is probably better adapted for cattle, being of a nature less heating. It cannot, however, be grown, as is the case in the West Indies, without the aid of water, nor is the return yielded so great as some of the other articles at present in use, as forage for cattle, under the name of 'Kuddol'; these are first—Indian corn and Juwari (Holcus Sorghum) raised after January, and raised solely to feed cattle on. These afford a very succulent and nutritive forage.

2nd. The tops and green leaves of the sugar cane. These when obtainable in plenty are (probably with justice) reckoned superior to all other articles of green food for cattle.

3rd. Various Leguminous plants grown for the sake of the straw.

4th. The leaves and tender branches of the Acacia Arabica, or Baubul. These are especially sought after for the grazing of sheep.

5th. Leaves and branches of the Erythrina indica, and other varieties.

6th. Do. The Pee-pul,* especially for camels.

As regards ornamental trees and shrubs, the number of these introduced at various times by

* Ficus religiosa.—H. H. S.

amateurs and practical horticulturists is considerable, and I believe I may with safety say, yearly increasing.

For introduction of many ornamental, as well as useful trees and plants, the community is deeply indebted to the late Colonel Hough, to Mr. Nimmo of Bombay, and to others. Of ornamental plants introduced of late years, I may name the Brugmansia arborea, Cassia sumatrana, Maurandia, Quisqualis, and many others.

The undersigned has succeeded in raising the American Black Locust tree (Robinia Pseudacacia) from seed. The Cocoa tree has been tried in the Deckan; but the aridity of the climate is found to be fatal to it. In the "dank" or damp jungles under the ghats, it may possibly succeed better, and as it can be planted in half-cleared land with advantage, may, along with the Coffee plant, hereafter become an article of some importance to the cottager dwelling under the ghats.

Manufacturing and Commercial Articles—Oils, Gums, Dyes, &c.

With reference to the manufactures of this part of the country, it is difficult to describe the extensive and silent desolation which the extinction of many petty branches of industry has given rise to. This has arisen chiefly from the import of Europe manufactured goods, and, secondly, from the decreased consumption caused by change in political relations. It seems to me hopeless to suppose, that any increase of raw exports, which the country may be capable of furnishing, can at all compensate for the destruction of the branches of industry before named. At the same time, there are many articles which India may supply in the raw state, with great advantage at least to a portion of the population. Of these, the vegetable oil and oil seeds hold a prominent part; but this branch of commerce is as yet quite in its infancy.

The second is Linseed.

The third is Sugar. As regards the Deckan, I have (from actual trials made,) no doubt but that the article can be manufactured and sold at a very remu-

nerating rate for the supply of the European soldiers, &c. By them it is eagerly sought after, and the better qualities are in like manner preferred by European families at Poonah, to the Bazar article. That sugar could bear the expense of inland transport to Bombay, and hereafter of freight to, and duties in, England, seems more doubtful, and must in a great measure depend on the rate at which the cane itself can be purchased from the grower; but the profit from the sale of sugar to consumers within the province is certain.

Of the various gums produced within the limits of the Presidency, I may mention that of the Gardenia gummifera, (Decamali), as likely, when better known, to engage a large share of interest, particularly for use in the more sultry climates of some of our colonies. Its effects in preventing the access of flies to festering wounds and running sores are remarkable.

The extract procured from the bark of the Butea, that of the Buchanania latifolia, the Syzygium Jambolana, &c. are likely to be of consequence to the tanners, and could be produced here in large quantities. The same powerfully astringent extract is produced from the bark of the Acacia arabica.

Of all, or of most, of these extracts, the undersigned has had the honour to submit specimens to the Asiatic Society's Committee, and he presumes, that they are now under report; whether the species of Smilax indigenous here (S. ovalifolia) possesses the properties of the genuine Sarsaparilla of commerce, the undersigned has not yet had an opportunity of ascertaining by trials on an extended scale.

Should this be the case, the medical stores at the Presidency can be supplied with the drug at one-eighth of the present cost.

In regard to Linseed (above-mentioned), the undersigned has omitted to state in the proper place that he this season contracted for the growth of Linseed to the extent of thirteen acres. The untoward nature of the season for the Rubbee crops, caused by failure of the latter rain, renders it probable that this year the trial may not be very successful. The experience of another season may lead to a better result.

ALEX. GIBSON,

Superintendent Botanic Garden.

Dapoorie, 6th Feb. 1840.

Northern India.

From MR. HENRY COPE, *late Secretary of the Horticultural Society at Meerut, to* DR. SPRY, *Secretary of the Agricultural and Horticultural Society of India, dated 30th September*, 1839.

MY DEAR SIR,

As the introduction of plants from England, and vice versâ, has been made the subject of inquiry in your Society by a Special Committee, and you have solicited suggestions from members, I have taken the liberty of sending a copy of a letter addressed by me some years since to the Secretary of the Horticultural Society of London, which though hastily written, may contain a hint or two the Committee might find useful in their present researches. As it stands, if the copy affords but a single item of novelty in hints, I shall be happy in having contributed even that little to the labours of the Society, which are progressing steadily and usefully in their career.

I have only found leisure to add two or three notes, which may interest.

HENRY COPE.

SIR,

I have the honour by direction of the Committee of the Horticultural Society of Meerut, to address you in the confident hope that numerous as your operations may be, and distant as is our relative position on the face of the globe, you will, as the official organ of an Institution, which may with strict propriety be termed the parent of all Horticultural Societies, be enabled to devote occasionally a few moments of your leisure in the year to the concerns and wants of one of its offspring, if I may be allowed to use the term.

In order to enable you to judge, as far as the general outline of the geographical history of vegetable products will admit of your doing so, permit me to mention, as it is scarcely reasonable to suppose that you can be acquainted with the exact nature of our locality, that our station is situated between the 29th and 30th degrees of northern latitude, on an extent of plain bounded east and west by the rivers Ganges and Jumna, called the Doab, and reaching about 130 miles northward to the foot of the Sewallick hills, a portion of the great Himalayan chain, which may in fine weather be distinctly seen from Meerut.

Should you be acquainted with Dr. Royle's account of the climate enjoyed by the Saharunpore Botanical Garden, which is but one degree to the north of us, you will have a pretty exact notion of that which we have here; and when I mention that in the Saharunpore garden, are found not only the Laurus Camphora, and Melaleuca Leucadendron, but many other tropical plants; beside plants from very high regions of the Himalayan range, and that the Caryophyllus aromaticus* flourishes in the gardens of the Taj at Agra, about 130 miles south of Meerut, you will at once see the capabilities of our situation, and the extent of improvements which might, with a little care and industry, be effected in the Agricultural and Horticultural pursuits, both of the Europeans who are beginning to reside here with a view to permanent settlements, and of the native cultivators of the lands, whose means of subsistence depend exclusively on their crops, and who are no further advanced in their notions of agriculture than their forefathers were for hundreds of years before them, with the exception of a very small portion residing in the immediate

* Is not the Allspice or Pimento meant?—H. H. S.

vicinity of military cantonments, who have found it to be much to their interest to cultivate a few ultra-Indian vegetables, &c., to supply the demand of the European occupiers of stations.

The soil is in general rich, when not exhausted by repeated crops, but the dearth of firewood driving the natives to the use of the dung of their cattle as fuel, is an immense detriment in depriving the soil of the manure it actually stands in need of to restore its vigour. The consequence is, that the crops are very stunted, and the European seeds deteriorate excessively after a few years, if committed to the hands of the native. This naturally leads to the consideration of the great necessity of forest trees being planted in vast numbers throughout the country. The mangoe tree is the only one for hundreds of miles that may be said to be planted in any quantity, and the fruit is so much esteemed, that it is seldom that the trees are cut down for use until they have done bearing, when they are, for the most part, rotten to the core.* There are many trees that

* The plantations on the banks of the Doab Canal, for a distance of about 150 miles, form an exception to this rule; attributable to the indefatigable exertions for the improvement by Capt. Cautley, Superintendent of that noble and most useful undertaking. It may not be amiss

might, if extensively planted, be both an ornament to the country, and of infinite utility as timber; and first—the Mimosa serissa, Dalbergia sissoo, Shorea robusta, &c. are all fast growing, handsome, and most useful trees; but from an apparent apathy to every thing (mangoe excepted) which does not bring them in an immediate return for their pecuniary outlay, or personal trouble, the natives seem to have made no attempts to plant these or other similar trees.

It would also be highly desirable if we could introduce and raise some of the valuable trees growing on the continent of central America, the West Indies, and other parts of the globe, assimilating in

to allude to the very great probability of the speedy commencement of the Great Ganges Canal, which it is proposed to draw from that river at a mile or two below Hurdwar, and to carry more or less, through the centre of the Doab, to the vicinity of Kanouj, where the borrowed treasures will be restored to the parent stream.

The Honorable the Lieut. Governor in a late visit to Saharanpoor, examined I believe the details of this great undertaking, and a proposal to raise funds by means of a Joint Stock Company, should the Government not be able to supply the necessary sums, (estimated at, I believe, from 40 to 50 lakhs), was spoken of. I ought to add, that it is intended to make the Canal one of navigation as well as irrigation, by which means a double source of revenue will be insured.—H. C. *February* 1841.

climate with ours. I have but little doubt that the Logwood and Mahogany would succeed well, especially as the Swietenia febrifuga is indigenous. Would you therefore kindly try and procure for us seeds of all such trees ?*

The nature of estates, mostly in the hands of the Zumeendars, who possess not only great extent of land, but also a considerable influence over the ryots who rent their land, would seem to be peculiarly favourable to the introduction not only of a systematic and constant plan of planting to a large extent, but also of introducing, though certainly only by degrees, such improvements in agriculture as it might be deemed necessary to recommend to them.

The deterioration and scantiness naturally consequent on the great want of manure in the soil, leads

* Note.—The vast importance of attending to the above suggestion of Mr. Cope, as far as the Sugar districts are concerned, has been of late forcibly brought to the notice of the Agricultural and Horticultural Society of India and the public by the pen of Mr. Tucker, Collector at Azimghur. This gentleman has offered a gold medal for the purpose of promoting tree cultivations. The Society has brought the subject to the notice of Government, and papers and information have, in consequence, been called for, which are calculated to lead to most beneficial results. Vide Proceedings of the Society for November 1840, and for April and May 1841.—H. H. S.

us to the consideration, in the second place, of the means we might adopt to improve the nature of the crops, and to endeavour, as far as our observation of their present means would admit of, to find for the cultivators some trifling substitute for the manure generally employed. There is not a doubt that by introducing better varieties of seed than are at present procurable for the sowing of the lands, a vast improvement would take place; and that by recommending, to a further extent than is now practised, the plan of frequently changing the crops on the same ground, much might be done.

The staple produce of this part of India is decidedly wheat in its different shapes, and the climate seems well suited for its cultivation. It would therefore be very desirable to procure several varieties of this vastly extended grain from different parts of the globe; and as from your situation in, we might say, the metropolis of the world, you have every opportunity of procuring, and selecting any thing that may bear on your own and our pursuits, we shall be really thankful if you would be so good as to endeavour to forward to us, so as to reach us here by August of next year, samples of all the farinaceous grains procurable in London, including Barley,

Oats, Rice, &c.* We believe that Mr. Anderson of the Chelsea Garden, and Mr. Sinclair, has paid great attention to the culture of them. The other crops cultivated, generally being raised from indigenous plants, will admit of being rendered more productive by better methods of cultivation, and a decided improvement in the nature of the soil by the addition of the manure it stands so much in need of.

A great desideratum in the agriculture of this country is an improvement in the implements at present in use amongst the natives, which are of the most simple and antique construction. There will be, no doubt, a very great difficulty in introducing any thing of the kind, especially on the score of expense; but however averse the Hindoos may be to part with more money than they can help, still they

* I regret much to say, that these suggestions met with but little attention on the part of the Horticultural Society of London. Although the Horticultural Society of Meerut offered to defray all expences, they only received from the Secretary in London some seeds, chiefly flowers, not one of which vegetated, and a box which on being opened was found to contain a quantity of sand, in which five varieties of potatoes had been packed. It is indeed a pleasure to compare this apparent apathy with the zeal and activity which follow out in the Calcutta Society the most distant hint of useful description, and to know that this zeal in the good cause will bring its own reward.—H. C.

would not entirely close their eyes to the chances, and if used, the certainty, of saving both labour and time by adopting better implements for their staple occupation.

To enable us to effect this, we shall esteem it an especial favour, if you could make a small selection of models of Agricultural, and at the same time Horticultural implements for transmission to us. We would, with your permission, suggest that they should be such only as are likely to suit the soil, which though in some few places clayey and hard, is for the most part of a light sandy nature. You will also be pleased to bear in mind, that bullocks of rather a small breed are in general use here. We would further suggest your only selecting such implements as are likely to cost the least in making. Models in wood, capable of being taken to pieces, would be preferable to metal ones.

With regard to ultra-Indian plants of a culinary description, which may be said to be strictly within the sphere of a Horticultural Society, the potatoe stands foremost as regards not only its utility, but also the extent to which its cultivation has been brought to in India. But as far as our observation goes, there is but one variety produced in

the country. Whether it has been found on trial that this is the only variety that will answer, or whether the original importers, finding that it speedily spread, took no trouble respecting the introduction of other varieties, we cannot say; but it is very certain that no other variety is found at present. We are specially anxious to procure for trial a few of the numerous varieties so celebrated in England and Ireland, and shall thank you, as no doubt there are means by which they can be effectually protected from injury during the voyage, to select some of the best kinds for us, and despatch them so as to be in India before the season for planting them the next year, which commences here about the latter end of September, or beginning of October.

We ought previously to have mentioned, that great exertions are making to improve the Cotton, Tobacco, and Sugar of India; any better sorts of seeds of these plants, or any information respecting their cultivation, will be most acceptable to us. The desire of improving Hemp, which is here used only as furnishing an intoxicating drug, and of Flax cultivated for the expressed oil of the seed, by introducing better kinds of seeds, induce us to place

them on our list of desiderata. The next plants which have attracted considerable attention from the readiness with which they seem to be acclimated during the cold season, are those of the natural order Cruciferæ, amongst which the Cabbage, Cauliflower, and Mustard are prominent. But still there are many more, that might be introduced with advantage. In fact, every thing that might in any way be likely to be useful as an article of trade, or a link in the almost interminable chain of culinary vegetable products, cannot but prove interesting to us. Our desire is to improve what is already before us, and introduce what can be made useful.

At the present moment the natives have, with the exception of those in the neighbourhood of cantonments, been but very slightly made acquainted with the great benefit they would derive, as far as their sustenance is concerned, by an increase in the sources whence they might derive the same; and depend almost entirely on wheat and chunna, (Cicer Arietinum) for their food. If that crop should fail, they must either starve—as has been the case in many instances, or drag on their existence in a miserable state, till the time arrives for reaping another crop; whereas, if they were extensively

acquainted, and provided with the means of raising other crops at different seasons of the year, their situation would be materially altered, and rendered more—comfortable, I was going to say,—but more endurable; as I really believe the Hindoos especially have very scanty notions of comfort, at all events to accord with our own on the subject.

If we have the improvement of the staple productions of the country at large at heart as our principal object, I will not attempt to deny that there is at the same time a latent selfishness, if it may be so called, which leads us to wish ardently for the introduction of such of the flower-bearing plants of our native land, as are likely to thrive with us.

In a word, we wish to improve our collections of ornamental plants of every description; and although we cannot hope, with any chance of success, to infuse any extensive taste for the cultivation of flowers amongst any but the highest class of natives, and even then with difficulty, as those female members of families who in England may with truth be said to be in many instances the patronesses and almost exclusive votaries of floriculture, do not take any interest in the matter here, still we shall be

glad of as extensive a collection of ornamental garden seeds as can be conveniently procured for us. The addition of the seeds of such plants as have been introduced into England from America, will also be very thankfully received.

I have in my hurry overlooked a very material point in our prospects, viz. the consideration of fruit-bearing trees. It is certainly true, that India produces very many kinds of, and those very excellent, fruits; but as variety and improvement is the grand desideratum in every department which may be said to come within our sphere, we wish, after paying the attention the subject most undoubtedly requires to the cultivation of the indigenous fruits by means of grafting, &c. and the introduction of fruits from our neighbours of Kabul, Kashmeer, Persia, and the Indian Archipelago, further to endeavour to raise some of those fruits so deservedly admired for their excellent flavour in Europe. The progress made with the apple and the pear has been very trifling; the cherry is scarcely known; the almonds and the apricot are all in their infancy; the chesnut, which I am sure would thrive here, I have never heard of; the many bearing shrubs that abound in Europe, have scarcely been

tried.* The filbert and hazel are unknown except in the Hills, and the vine is in a very languishing condition for want of improvements.† There are also a few seeds of the Umbelliferæ which we imagine would do well here, especially the carraway, fennel, &c.

I trust, you will be so good as to view this communication as affording you a considerable field for

* Since this was written, I have been informed by Major Corbet, dated Lohoghat, Kumaon, 11th June, 1841, that in his garden at Havilbagh, he was very successful in grafting from imported apples trees on the crab of the Hills; and from a few good trees a regular supply of grafted plants might be depended on from that Province, consisting of apples, cherries, and plums. When Major Corbet left Havilbagh, he had about fifty apple trees in bearing (some of the fruit of which was sent to Dr. Wallich) also pears, which latter however were not good, and a great variety of plums.

† It may not be an uninteresting fact to mention to the Horticultural Society of India, that a pensioner of the name of Haylett, residing in Meerut, presented me on last Christmas-day, with a ripe bunch of grapes of good size, and very tolerable flavour, off a young vine, which I have recommended him to take care of, with a view to ascertain whether the circumstance was accidental or will be permanent.—H. C. *February*, 1841.

Grapes are produced in great abundance, and of good quality, at Hazareebagh, and Saugor territories, and generally throughout the Nizam's country, where sun-dried raisins can be made in great perfection.—H. H. S.

the further diffusion of the benefits which have already been conferred on Society by the Horticultural Society of London.

The only return we can make you for the services we hope to receive at your hands, is a proffer of procuring for you a collection of Hill seeds from our gigantic neighbours of Hymalya, which we think would, in many instances, prove acceptable addenda to your gardens in England. We are afraid, however, that the extensive labours of Dr. Wallich and Dr. Royle, have left us but little to do.

We shall be very thankful by your having the goodness to communicate this letter to the Secretary of the Royal Asiatic Society, with the view of obtaining, as he will no doubt be happy to give it, his assistance in procuring the various articles we stand in need of, and we shall especially wish it to be submitted to the Right Honourable Sir A. Johnstone, V. P. of that Institution, than whom we know no one more capable of directing us as to the general objects we ought to fix our general attention on.

Northern India.—*(continued.)*

From the late A. RONALD, ESQ. *Planter at Dunbaree, on the eastern side of the Goruckpore District, to* JOHN BELL, ESQ. *former Secretary of the Agricultural and Horticultural Society of India, dated June* 8, 1837.

SIR,

Having received a circular from the Society, of date 31st inst. last, I now beg to lay before you replies to the thirty-four questions therein contained, to the best of my ability. Before proceeding in this, I have here to state that the district in which I am situated, is the eastern side of Goruckpore, running along the banks of the great Gunduk, which bounds it to the north, and running about eight miles to the south-east, where it joins the Chuprah district.

1st.—The soil in general is of a loamy nature, and rather binding, with occasionally here and there some of a sandy kind. It is, however, retentive of moisture during the warmer months; but very apt to harden, or be crusted, by any showers of rain. The climate is salubrious, and partaking of a medium, being neither very moist, nor very dry.

2nd.—The land is possessed by both great and small proprietors; but in general by the former, who tend more to prevent the improvement of the country than the latter. Having so much in their power, they act as little despots over the Asamese, or cultivators, who are oppressed by the proprietor's servants on all hands; and as he seldom inquires about particulars, or sees his property, the means of redress are out of their power.

3d.—The land is generally occupied by small farms.

4th.—The land is employed both in pasture and husbandry.

5th.—The grasses are indigenous: viz. Doob, Raree, and Dabee. The Guinea grass has never yet been tried, and in consequence I cannot say to what extent it might be cultivated with advantage.[1] The Clover I have tried, having procured some seed, the produce of the eastern side of the Gunduk; but it is very small in leaf, and by no means strong or healthy.

6th.—The stock of cattle is of a small kind. I do not think that the breed could be improved, but

1 Since this was written, seed in abundance has been supplied by the Agricultural and Horticultural Society of India, and I believe the Guinea grass is now well established in the Goruckpore district.—H. H. S.

new breeds might be tried. Few however could be induced to pay attention to it.

7th and 8th.—There are no particular crops set apart for irrigation, nor is irrigation at all used.

9th.—Dhan, Kodah, Jangoon, Sawah, Murrooah, Juneirah, Barley, Wheat, Gram, Peas, Dhall, Mustard, and Linseed, are the crops.

10th.—Juneirah after Rice or the others, according as they may choose, but in general only this is the rotation crop.

11th.—Indigo has not yet been cultivated; but I have now taken some hundred beegahs for next sowing. Cotton is cultivated, but not much, and that too of a very inferior kind. I applied for some cotton seed when in Calcutta, but there was then none in store. Some American Tobacco seed then obtained did not vegetate, although tried at three different times. Sugar-cane is cultivated to about an eighth part of the cultivated lands.

12th.—The soil is almost the same as before mentioned.

13th.—Neither the foreign cotton seed, nor the Otaheite cane, have yet been introduced.[2]

2 Otaheite cane now flourishes abundantly in some parts of the district.—H. H. S.

14th.—Fallowing is never practised.

15th.—Very little manure is used, except for Opium and Sugar-cane lands; and I fear, much could not be expected.

16th—Oxen only are used in the husbandry of the district. Mules would not answer, as the natives have a prejudice against them, being akin to a donkey.

17th.—The implements used are those in general use; and either originals or models could be procured, if required.

18th.—Barley sown in November is cut in April; the same applies to wheat, gram, peas, mustard, linseed. Dhall is sown in May and cut in April. Rice two crops, one sown in March and cut in September, and the second sown in April, and cut in November. Kodah, Jangoon, Sawah, Murrooah, and Juneirah, sown in June and cut in September.

19th.—About one-fifth of the district in general is in waste. There is a great deal of wood, which accounts for it.

20th.—Wages are paid in kind. Ploughmen and weeders are employed only from sunrise till noon, and get 1½ seers (3 lbs.) Bz. weight of grain for their labour, and a little food for the day, and are

always paid at this rate, whatever be the current price of grain. Labourers at the Kodalee, (spade,) sunrise to noon, get 2 seers (4 lbs.) of grain, Bz. weight, and for extra working are paid over and above.

21st.—Very little attention is paid to draining lands, and those used are common channels dug round a field, about two feet wide, and one to two feet deep.

22d.—No attention whatever is paid to embankments.

23d.—The country is rather extensively wooded, and in general contains mangoes, mahooah, and jack.

24th.—The roads, if such they can be called, are infamous, and disgraceful to the highest degree, and are the most insuperable bar to improvement of any sort.* Since I have been here, a period of three years,

* The assertions contained in this paragraph, attracted the particular notice of the Right Honorable the Governor General, at whose instigation an inquiry into its correctness was set on foot, attended with the following result:—

No. 1499.

To G. A. Bushby, Esq.

Secretary Government of India.

Rev. Depart. *General Department, Fort William.*

Sir,—I am directed by the Honorable the Lieutenant Governor, to acknowledge the receipt of your letter, No. 565, dated the 22nd July

I have not seen a single labourer employed on them, although Government charges one per cent. on the

last, regarding the bad state of the roads in Goruckpore, and in reply, to forward for the information of the Right Honorable the Governor General of India in Council, the accompanying copy of a letter from the Secretary, Sudder Board of Revenue, No. 408, dated the 2nd instant, commending the exertions of Mr. Reade, in the improvement of the roads in his District. This account is fully borne out by every Report on the subject, which has reached his Honor, and there is the best reason to believe, that the allegation of Mr. Ronald is peculiarly destitute of foundation.

2nd. His Honor trusts, that endeavours will be used to give publicity to the refutation of the reflection which has been cast on Mr. Reade.

3rd. It may be generally observed, that such accusations are more likely to be made at Goruckpore than elsewhere. Numerous grants of lands have been there made to European capitalists, and many conflicting interests have thus been created. Each grantee is of course desirous to have a good road made to his location, and it is advantageous to have this well done, and at the public expence. When, however, we reflect that these grants are often situated in the remote parts of the District, distant from the great lines of commercial intercourse, it is evident that many such wishes must remain ungratified. Ill will and discontent may thus be causelessly excited, whilst the avenues for giving expression to these feelings, are numerous and obvious; the fear, if any thing, is, that funds, which ought to be primarily devoted to the improvement of great lines of intercourse, should be unduly perverted to the promotion of individual interests.

I have the honor to be, &c.

(Signed) J. THOMASON,

Secty. to Govt. N. W. Provinces.

AGRA, *the 22nd Oct.* 1840.

Malgoozaree collections, for the express purpose of keeping them in repair. Much commerce is prevent-

(Copy.)

No. 408.

To J. THOMASON, ESQ.

Secretary to the Honorable the Lieutenant Governor,
N. W. Provinces, Agra, Revenue.

SIR,—In continuation of my letter, No. 362, dated the 4th ultimo, the Sudder Board of Revenue, North Western Provinces, direct me to forward for submission to the Honorable the Lieutenant Governor, the enclosed correspondence respecting the appropriation of the road fund in Zillah Goruckpore.

2nd. The Board observe, that Mr. Reade, the Collector, has been indefatigable in his endeavours to improve the communications of his District, and has excited in the people a degree of interest in the matter, and received from them a degree of co-operation in respect of uniting on Committees to superintend the construction of roads, and direct and control the expenditure of the fund, such as the Board have seen no where else. A great deal has been effected in a short time, for the commercial interests of the District, and the roads are really, where the Board have had an opportunity of seeing them, so good, that a person may travel by night and sleep in his carriage in comfort, an experiment that few would be willing to make on any other roads with which the Board are acquainted.

3rd. Mr. Ronald's reclamation, the Board observe, appears to have rather had reference to his own particular accommodation, than that of the public.

I have, &c.

(Signed) H. M. ELLIOT, *Secretary.*

SUDDER BOARD OF REV.

N. W. Prov. Allahabad, 2d October, 1840.

(True Copy,)

(Signed) J. THOMASON,

Secretary to the Govt. N. W. Prov.

ed in consequence, where manual labour must be resorted to. The carriage of grain, &c. is also greatly kept under by it.

25th.—No streams intersect the district.

26th.—Water is the mode of transport in use where it can be had. Land carriage, as before stated, is impracticable from want of roads.

27th and 28th.—As to the question as to what extent have manufactures or commerce been carried on, and if a manufacturing district, what proportion of the population has been thrown out of work by the cheaper imported European cottons, I may remark, that little or none is yet carried on; but I should think the introduction of them advantageous from what I have seen elsewhere.

29th.—There are no Societies in the district instituted for the improvement of agriculture.

30th.—The natives have no turn for improvement.

31st.—The obstacles to it are the high rent of land, and the grinding oppression of the Native officers of the Revenue. Though I am not a member of the Agricultural and Horticultural Society, I shall be happy to do all I have in my power to forward the interests of the Society. If favoured with small supplies of sugar-cane, cotton, Guinea grass,

and clover seed, I would give them a trial, and communicate the result.

(Signed) ALEXANDER RONALD.

Northern India.—*(continued.)*

From R. MONTGOMERY, ESQ., *Magistrate at Azimghur, to* JOHN BELL, ESQ. *former Secretary to the Agricultural and Horticultural Society of India, dated September 27,* 1837.

SIR,

I have much pleasure in forwarding a map of this district, and answers drawn out by Mr. Tucker and myself from the official records of this district, to the queries circulated by the members of the Agricultural Society. The recent detailed professional survey for the purpose of settlement, has afforded us the means of giving accurate returns of the total area cultivated, culturable, and barren waste land,

whilst the settlement now concluded, has enabled us to fill up the other columns, relating to the revenue of the district. The estimate of the quantity of cloth, silk, and tussur manufactured, has been obtained from returns of looms at work. The Opium is the average of the actual produce for the last three years, and the Indigo is pretty nearly the truth. The land under sugar cultivation was, as I before said, chiefly taken from an actual measurement of the quantity in each village. The population return has been estimated at three souls to each male adult, a nearly similar result may be obtained from the census of houses, allowing six individuals to each house; but I am inclined to think, that the census here given is above the mark.

*** The tabular statement and map appeared in the sixth volume of the Transactions of the Agricultural and Horticultural Society of India. The former has been again incorporated with the present papers, in order to make the information complete.

Resources of the District of Azimghur referred to in Mr. Montgomery's Communication.

Name of Pergunnah.	Number of Villages in each Pergunnah.	Malgoozaree.		Minhaee.		Total Area in Acres.	Government Jummah in Company's Rupees.	Average Assessment on total Area per Acre.	Average Assessment on total Malgoozaree Area per Acre.	Average Assessment on Land actually under cultivation per Acre.	Land in Sugar-cane in Acres.	Number of Pieces of Cotton Cloth manufactured annually.	Number of Pieces of Silk Cloth annually.	Number of Pieces of Tussur annually.	Opium and Indigo.	Number of Houses.	Number of Male Adults.	Estimated Population.
		Cultivated Acres.	Uncultivated Acres.	Lakhiraj.	Barren.													
Nizamabad, ...	1,133	1,17,831½	41,052	5,780½	1,12,054	2,76,718	3,04,069	1 1 7	1 14 11	2 9 3½	11,978	60,268	...	628		26,721	66,639	99,917
Mahol, ...	519	73,213½	49,661	5,685	37,323½	1,65,883	1,66,212	1 0 1	1 5 8	2 4 4	7,382	21,828	...	...		17,963	38,604	1,15,812
Suggree, ...	671	60,432	23,107	4,257	58,871	1,46,667	1,27,493	0 15 11	1 8 5	2 1 9	5,650	4,656	...	...		15,695	34,879	1,04,637
Deogaon, ...	450	53,949½	8,794¼	2,621½	58,599½	1,23,565	1,17,261	0 15 2½	1 14 9	2 2 6	3,016	44,292	...	...		11,870	31,539	94,617
Mohummudabad,	744	75,930	12,984	4,149	1,02,290	1,95,453	1,71,800	0 14 8	1 15 3	2 3 9	9,926	3,55,284	6,768	2,34,676		13,848	47,269	1,41,807
Mhow, ...	64	4,661	3,888	225	5,530	14,304	11,727	0 15 1	1 7 7	2 8 0½	488	Included in Muhummudabad.				2,328	4,875	14,625
Atroulia, ...	360	40,835	22,641	2,975	7,985	74,436	81,471	1 1 6	1 4 6	1 15 11	6,438	61,812	...	28,032		6,695	19,130	57,376
Kouria, ...	145	19,631	12,699	1,382	4,910	38,622	37,919	0 15 8	1 2 9	1 15 1	2,230	5,208	...	2,544		3,512	9,894	29,682
Gopalpoor, ...	174	15,016	7,385	1,259	6,810	30,470	27,550	0 15 5	1 3 6	1 13 4	1,645	3,696	...	18,720		2,522	7,916	23,748
Nuthoopoor, ...	326	37,481	10,276	1,121	26,769	75,647	58,720	0 12 5	1 3 8	1 9 0	1,360	14,208	...	...		4,527	20,778	62,334
Gosee, ...	375	43,609	21,418	1,602	38,565	1,05,194	94,079	0 14 3½	1 7 2	2 2 6	3,215	40,620	...	3,168		8,519	40,577	1,21,731
Chiriakote, ...	282	21,096	10,017	2,089	12,689	45,921	43,604	0 15 2	1 6 5	2 1 1	2,184	18,864	...	31,104	1,699 Mds. of Opium.	3,256	14,519	43,557
Kurriatmittoo, ...	66	6,050	2,656	422	5,672	14,800	14,288	0 15 6	1 10 3	2 5 7	914	1,744	...	...	1,500 Mds. of Indigo.	694	1,378	4,134
Bilhabans, ...	163	18,511	8,535	1,471	10,312	38,829	39,937	1 0 5	1 7 7	2 2 6	1,986	5,616	...	...		1,156	2,685	8,055
Secunderpoor, ...	600	1,44,200	16,972	4,322	54,409	2,19,903	1,56,673-2	0 11 5	0 15 6½	1 1 4½	15,217	...	...	...		27,565	66,418	1,99,254
Budaon, ...	125	17,347	4,260	790	9,520	31,917	25,507	0 12 11	1 2 11	1 7 6								
Total, ...	6,197	7,19,793¾	2,55,975¼	40,150¾	5,52,469¼	15,98,529	14,72,308-2	0 14 11	1 7 5	1 9 1½	76,632	6,37,496	6,768	5,18,772		1,55,931	4,06,100	12,18,300

N. B.—The Population averages 1,9,659 souls to each village, and 487.8 to the square mile, on a surface of 2,497 3 square miles.

The common, small country Cattle, Sheep, and Pigs, admit much room for improvement; no person in the district appears disposed to pay attention to improving the breed.

Irrigation is very extensive throughout the whole district both from tanks and wells. The average depth at which water is found, varies from 27 to 45 feet. The soil being firm and good, is well adapted for Cutchà wells, of which there are not less than five or six in each village.

Ruhur is the only crop which is never irrigated in the Purgunahs; nearest the river the water is close to the surface, and irrigation is performed by means of a vessel attached to the long arm of a lever. In the other Pergunahs the common *Mote* (leather bag) is used, drawn either by men or bullocks. The water from tanks is thrown up in baskets, swung by a couple of men; but Persian wheels, or other machinery, are quite unknown.

The crops commonly cultivated, are Sugar-cane, Wheat, Barley, Ruhur, Rice, Indigo, Opium, Tobacco, Gram, Peas, Maize, besides the usual Budowy crops of Murowah, Selah Rodoo, Tangoon, &c. &c.

In the strong lands a succession of Rubbee crops are cultivated, without any rotation. In the poorer

lands, the Budowy and Rubbee crops are taken alternately. After cutting the Budowy crops, Gram and Peas are often sown. Indigo is cultivated to the extent of about 1500 maunds. Cotton is not cultivated; it would be desirable to make the experiment. Sugar-cane is cultivated to the extent of about 431,446 maunds, the produce of 57,932 acres actually under cultivation.

There is no such marked peculiarity in the soil as to require any particular specification, Sugar-cane, Opium and Tobacco generally devoted to Budowy.

Foreign Cotton has not been tried. The Otaheite cane to a small extent was introduced last year, and appears to flourish; but it remains to be tried what produce it will yield.*

As long as the Zemindar can get what will repay the labour, he will generally cultivate the land; few of them being wealthy enough to allow their lands to lie fallow.

Manuring is used to a very small extent, and consists usually of burnt weeds, and the refuse collected from the village dung-hills. Sheep are occasionally penned in the fields, but the supply from this source

* It has since been cultivated more extensively.—H. H. S.

is very limited. Oxen and bullocks are commonly used both for carriage and agriculture. The few mules in the district are small, and good for nothing.

The ploughs, carts, and other implements of husbandry, are the same as those used in other parts of the country. Models would not be worth procuring.

The Budowy, or rain crops, are sown on the first fall of the rains, which in this district usually takes place about the end of June. They are cut about the middle of September. The Rubbee crop is sown in October, and cut in February and March. The Sugar-cane is laid down in the beginning of March as fallow land, and in land cultivated before Rubbee, after it has been cut in April. The extent of waste land by the late survey, amounts to 848,534 acres, of which 255,975 acres are culturable.

The rate of labour varies with the different classes of workmen. Ahirs, Choomars, and Passees, get on an average grain to the value of from one to two rupees per mensem. The carpenters and blacksmiths are allowed in general a few biswahs of land, besides a small allowance of grain from their employer. Weavers get two rupees a month. Labour commences at sun-rise, and is continued till sun-set, with the intermission of one hour at 12 o'clock.

No attention is paid to draining lands, which from the dry nature of the soil is not necessary.

Bunds are common across small rivulets, and the Bysoo river in Pergunah Deogaon, in particular, is bunded across in many places for the purpose of irrigation.

The country is in general well wooded with Mangoe topes; there are also Peepul, Bhurs, Tamarinds, Babools, &c. &c.

The roads are for the most part good, and very numerous. Bridges are being constructed over the different Nullahs, by which the district is intersected.

The district being situated between the Ganges and Gograh, on the land which formed formerly, most probably the channel of the latter, is intersected by innumerable small rivulets. None of them are navigable, except the Tonse and Surjoo, which can only be used during the rains, and are so tortuous, as to be little navigated.

For the above reasons, land carriage is the only one used for the conveyance of produce.

The amount of manufactures in the district is as follows:—

Number of Looms.			Number of Cotton Cloth prepared in a year.		Number of Silk Pieces prepared in a year.		Number of Pieces prepared in which there is a mixture of silk and thread, termed by the Natives Tussur.		Total Pieces and the Value.	
Looms for the manufacture of Cotton Cloth.	Looms for the manufacture of Silk and Tussur.	Total.	Number of Pieces.	Total Value.	Number of Pieces.	Total Value.	Number of Pieces.	Total Value.	Total of Cotton Cloth, Silk and Tussur.	Total Value.
10,561	3,121	13,682	6,73,896	14,25,543 9 16	6,768	27,643 12 16 0	3,18,772	8,19,121 0 0	9,99,436	22,72,308 6 12

The state of commerce will be evident from the statement here given. As must always be the case, it has given a great stimulus to Agriculture, especially of late, from the greatly increased demand for Sugar-cane.

The district contains a large manufacturing population, and they have been obliged to resort partially to Agriculture as a means of subsistence, without entirely deserting their former avocations.

A Society has lately been established.

The natives have not the slightest turn for improvement. It remains to be seen, what effects the Society now established may have in rousing them from their apathy, and inducing them to exert themselves for their own benefit.*

Poverty, ignorance, and apathy of the inhabitants, and the retired situation of the district, remote from any of the great lines of communication, are the obstacles to improvement.

* Under the indefatigable exertions of Mr. Tucker, the late Collector of the district, this Society has grown up to some consideration, and several medals, and many prizes, have been awarded at the Annual Prize-show, for sugar-cane and vegetable cultivation. As many as seven silver medals were forwarded by the Agricultural and Horticultural Society of India last year (1840.)—H. H. S.

The Branch Society contains all the residents, who are all interested in the improvement of the district.

No native landlord will be induced to join this Society, although there are many who will be glad to derive benefit from its produce.

(Signed) R. MONTGOMERY,
Secretary.

54619

Central India.

Nurbudda Valley.

From Major OUSELY, *Political Officer in charge of the Hoshungabad district, to* JOHN BELL, ESQ. *former Secretary of the Agricultural and Horticultural Society of India, dated May* 14, 1839.

SIR,

In reply to your letter of 31st March last, forwarded to me by the Officiating Commissioner Saugor and Nerbudda territories, and copy of one to the Secretary to Government, Mr. Prinsep, 3rd February, with 34 questions, I have the honor to state, that I fear the station of Hoshungabad would hardly admit of the formation of a branch Society, there being too small a number of residents. I have at a very great expense succeeded in making a very good garden, but I should certainly never have attempted it, had it not been for the pleasure it afforded. I will circulate your letter, and endeavour to promote your object to the utmost. I beg to append answers to the queries above alluded to.

2nd. On the Mahadeo Hills at Puchmurry, about 5000 feet in height, I think there is every probability of success in an experimental farm; enjoying

as it does a fine, equal, cool climate, and having good soil, with little streams flowing in every direction throughout the year. In fact, many of the fruits and flowers of the plains, Mangoes, Limes, Chumgars, Cuchenar, &c. grow there indigenously in profusion; and also a great variety of the most beautiful flowers that are found in places of the same height; the distance, E. S. E. from Hoshungabad, is about from 50 to 60 miles. Another place is at Baitool; where the heat is very moderate, compared to what it is at Hoshungabad, but certainly nothing to equal Puchmurry in coolness, and advantages of water.

Principal Assistant to the Commissioner.

(Signed) J. W. OUSELY, *Major*,

1st.—At Hoshungabad. The soil is black, rich alluvial, having a depth of 30 or 40 feet, and generally the same from the Gunjal to Jhansyghaut, on the Nerbudda near Jubbulpore. The climate is not very cold in the winter season; I have in 15 or 16 years here, only twice witnessed the effects of severe frost. From April until the rains set in, about 20th June, it is very hot. Hot winds blow from 8 A. M. until 9 P. M., but the nights are cool and

pleasant. The season of the rains is cold, (seldom that close disagreeable feel of Bengal,) breaking up about 20th or 25th September.

2nd and 3rd.—The leases of land are in few instances to a large amount. The highest number from 35, or 40,000, down to 100 or less; but there are not above six or eight large Malgoozars, (revenue farmers). The villages are separately let, in general to single tenants, who do as they please in letting out fields to the Ryots: there are no proprietory farmers, or zemindars, all are lease-holders now, for twenty years from 1836.

4th and 5th.—The cultivation is chiefly in wheat and gram. A good deal of cotton is grown towards Nursingpore. Poor lands are used for pasture, and also the hilly tracts south: no Guinea grass or Clover has been tried. Lucern grows well here, and also the common, "Gooneree," "Kaeel," "Moocheil," "Doobh," "Puruwaie," "Sookul or Lumpa," "Kans," and "Burro." The four first are adapted to grazing, and the four last for chaffering. Kaeel and Moocheil are the best for cattle, and fetch the higher prices as hay. Gooneree, when fresh, is very good, not so dry. Doobh for horses. I can hardly fancy finer grass than the Kaeel and Moocheil.

6th.—The cattle of the valley are chiefly the Malwa breed, white straight-set horns, large ears, high hump, very powerful limbs. The bullocks are chiefly, from their larger size, used in hackeries; but are rather slow. The hill cattle are beautiful; spotted red or black on white ground, or the reverse, or mottled; wild, high spirit, and great strength, used chiefly in plough, rather smaller than the Malwa breed. The cows give little milk, those of the Malwa breed give a great deal. I cannot imagine any cattle prettier than those. I have procured a number of English, Malwa, Hurriana and Sandee, some from the Nagpore side, and Luckno-down; but none equal these in beauty and strength.*

Buffaloes are very plentiful, the best about Barha, half way from Hoshungabad to Gurruwarra; but generally small. I sent to Captain Jenkins, Commissioner in Assam, and Major White, Political Agent at Bishnath, to request their assistance to get some of the fine breed from them, and they were obliging enough to assist me in purchasing them twice; but from their savage wildness, they never

* Major Ouseley, who now (1841) resides at Dorunda, as the Political Agent of the Right Honorable the Governor General for the South-Western Frontier, has still a large farm yard of cattle of various breeds.—H. H. S.

reached me. I shall however send men again this rains, as I think great improvements might be made by mixing the breed. I have some hundred head of cattle, cows and buffaloes, now in an experimental farm, and I think that there is every chance of their improving in this fine grazing country.

7th and 8th.—Little irrigation is employed, the only fields watered, are sugar-cane, and Malies, or Kachee's land, (vegetable growers). The soil cracks too much to admit of the water running; you may force a bamboo or two tied together, down some of the cracks from 15 to 20 feet and more; they are fully a span wide.

9th.—Wheat crops are sown in October and November, and cut in March and April. Gram, which is sown with wheat, is cut in February or March. Rice is sown in June and July, cut in October and November; and with rice are sown Cotton, Kadoo, Kootkee, the pulses Oorud and Moong, Jowar,* Bujra,† Tillee‡ of one kind, &c. along with wheat, gram, sugar-cane, Ulsee or Teesa,§ Mussoor, and Tewra.

Aal is sown in June and July, and dug the third

* Andropogon Sorghum.

† Panicum (Penicillaria) spicatum.

‡ (Sesamum?)

§ Sinum Usitatissimum.—H. H. S.

year.* Koosm sown in October and November, flowers in January and February; it is very abundant. Huldee, (turmeric) Yams, &c. in abundance.

10th.—No alternation of cropping in the Nurbudda valley. I have endeavoured to introduce it, but with no effect.

11th and 12th.—There are only three or four villages in which Indigo is grown, and that in very little quantity; it appears not to be understood. Cotton is grown largely, and is very fine in poorish lands, light soil. Sugar-cane a great deal; there are several kinds, black, red, green, white and variegated. The black, red, and variegated are large and long; the green and white are thin and short. But Captain Sleeman, some years since, supplied me with some of the cane that he introduced, which grows beautifully, and is gradually supplanting the other kinds. The Goor made from this Otaheitian

* Aal or Haul (Morinda citrifolia) and Koosm, (Carthamus tinctorius) are two dye plants. The former is cultivated extensively through Southern Bundlekund and the Nerbudda, and is the root whence the red colouring matter for dyeing the common country cloths of Central India is obtained. For particulars of the mode of culture, the manufacture of this dye, and the expence, see Spry's Modern India, vol. i. Appendix. The flowers of the Koosm furnish a bright rose-colour of an evanescent quality.—H. H. S.

cane is said to be finer and better for making sugar, than that of any of the other sorts. I have this year sent a supply of cane to Mr. Wilkinson, at Sehore, and the Officer commanding at Asseergurh. Boorhanpore sugar-cane grows in the richest soil.

13th.—The cotton seed sent by Mr. Bell to Captain Sleeman, grew pretty well; but the gardener, I regret to say, destroyed the seed. The Otaheitian cane promises to supersede all others. I sent some Amrowty cotton seed, and wheat of a peculiarly fine kind, (Jululia,)* to Captain Jenkins of Assam; but I know not how it succeeded.

14th.—Fallowing is practised thus—when the land is worn out and exhausted, the Patels (owners) let it fall out of cultivation for three up to twelve years, and use it as grazing ground; the richer the soil, the longer the period it requires to recover; poor soil requires but a year's fallow, and will last but two or three; rich land last thirty or forty years.

15th.—No manure is used; but in sugar-cane fields

* Some Hoshungabad Wheat, (Jululia,) which was presented to the Agricultural and Horticultural Society of India, by Capt. Ouseley, through Dr. Wallich, and reported on by a Committee, was pronounced superior to any that the members had ever before seen in India. It weighed full sixty pounds to the bushel.—H. H. S.

I have all along endeavoured to induce the people to manure their fields; but they laugh at the idea.

16th.—Both oxen and buffaloes are used in the husbandry of this valley, the latter only by the poorer people. I think oxen better than mules.

17th.—The plough is the simple one used throughout India, the carts are made with solid teak wheels, bound with heavy iron tyres and with iron boxes. The wheels cost from 40 to 80 rupees a pair, and last for three or four generations, descending to the heirs; they are considered of vast importance in a family. The *bukua*, or barrow, a flat iron about two feet long by three inches deep, set into a block of wood, is I believe, used also in most parts of India. I could send models with ease, or the things themselves.

18th.—I have already mentioned sowing time for Khurreef (autumn harvest) crops; June and July, and cutting in October and November. Rubbee crops (spring harvest) sowed in October and November, cut in February and March.

19th.—In the Baitool division of the district, from the Baitool cantonments north for fifty miles, the country is a jungly waste, hilly and bad soil generally, but of course, some good. The climate prevents

the people from the plains going to reside there. I had pukha wells made at each stage on the road between Hoshungabad and Baitool, and now the Nujeebs (police guards) are as healthy as elsewhere, whereas for some thirteen or fourteen years, they died off dreadfully. Indeed I do not think so much is to be attributed to malaria or miasma, as to the bad stagnant water, drunk in these jungles, formerly was.

20th.—Wages—Masons get three, four and five annas a day; carpenters and blacksmiths the same; grammies (thatchers) two and a half annas; coolies two annas; boys one anna commencing work at sun-rise, and leaving off at sun-set, all the year round, having one hour in the middle of the day for dinner.

21st.—No draining is used, or required.

22nd.—Embankments for rivers are needless, the banks being so very high: but in the eastern Purgunahs (subdivisions) of Nursingpore and Chindwarrah, the fields are banked up all round about three feet high, and six, eight, or ten feet thick; this keeps in the water during the rains, and in October it is cut and let out for sowing wheat crops.

23rd.—The country is beautifully wooded. Teak, Rohinnee,* Taaj, Sissoo,† Mowah,‡ Gumrassee,

* Soymida Febrifuga. † Dalbergia Sissoo. ‡ Bassia latifolia.—H. H. S.

Salii,* Ebony,† Dhamun, Neem,‡ Tamarind, Mango, Jamin, Behra,§ Kawah, &c. in vast profusion. The Teak and Mowah grow very large. Ebony very fine.‖

24th.—The roads are hardly passable along the valley of the Nerbuddah, in the rains, towards Baitool and Nagpore. Soil more light and more passable; but there are no made roads in the district in any direction.

25th.—There are many hundred little streams which run into the Nurbudda from the south.

26th.—Water carriage from Nursingpore down to Hindia, used for corn and salt, along the Nurbudda; but not so much as it should be.

27th.—We have in no way improved the manufactures here since we got the country; the commerce may have improved; and as the population has increased, the agriculture is more extended; but as primitive as heretofore.

* Boswellia thurifera? † Diospyros ebenum. ‡ Azadiracta Indica.
§ Terminalia Belrica?

‖ The bastard Ebony tree of Central India, and also many other of the forest trees which abound there yield large quantities of rich and valuable gums. The writer of this note collected as many as fifteen varieties, when a resident in that part of the country.—H. H. S.

28th.—This is not a manufacturing district; but one of agriculture merely.

29th.—There are no Societies for the object of extending or improving.

30th and 31st.—The people of the district do not evince greater enterprise or turn for improvement than those of other districts, the only way to excite such a turn would be in practically shewing the benefit of the improvements alluded to. They comprehend no theoretic systems, and have as much objection as the government to be the first to lay out money that has even a chance of being sunk; a little in example would do more than any thing else. Indeed by shewing them my garden, with the grafted fruits, &c. procured from Madras, Calcutta, &c. I have induced many to make very nice gardens, supplying a few trees, &c. and procure cattle for breeding from other parts of the country. There are no obstacles, but that one before alluded to.

32nd.—I shall be very happy to supply the map wanted as soon as I have finished the settlement of the Baitool part of the district, which will be within a month. I have not sufficient leisure now.

33rd and 34th.—I know of no one, who has any turn for the objects of the Society; but will send

your letter to Colonel Wallington, commanding at Hoshungabad to ascertain. There are no other European inhabitants; but I know three or four influential Natives who seem desirous of improving their estates. Dewan Patel of Raipoor; the Raja of Sobapore; Indurjeet Chowdery of Amgang; Munsook Chowdery of Rohsulpore, &c., all would be glad to promote what they see are really improvements, and these are the people to look to, to spread our methods of improving, rather than entirely depending on European exertion.

(Signed) J. W. OUSELEY, *Major*,
Principal Assistant to the Commissioner.

Central India.—*(continued.)* BEHAR.

From R. H. MATHEWS, ESQ. *Indigo Planter, to* JOHN BELL, ESQ. *former Secretary Agricultural and Horticultural Society of India, dated Dearie vid Shergotty, March* 26, 1837.

SIR,

I beg leave to enclose replies to the queries of the 8th February last, for the information of the

Society, which I hope will be satisfactory as regards the Shahabad district.

(Signed) R. H. MATHEWS.

Q. 1*st.* The nature of the soil, and climate of the district?

A. Various; consisting generally of a light, sandy soil, mixed with clay; particularly along the Ganges and Soane; the interior mostly of a dark, blackish, hard, clay (Kuroyle) in lowest grounds, and sandy in the higher; climate the same as South Behar.

Q. 2*nd.* The manner in which the land is possessed; by great or small proprietors?

A. All along the Ganges and part of the Soane is possessed by two large proprietors; one the Rajah of Doomrong; the other a branch of the same family, Baboo Coowr Singh, with some few independent Zumeendars. To the south, generally by proprietors, subdivided into numerous shares.

Q. 3*rd.* The manner in which the land is occupied; whether by great or small farms?

A. Occupied generally by ryots of villages, to the extent of ten, twenty or fifty bigahs, according to their means, whether under the Zumeendars or Thukadars.

Q. 4th. The manner in which the land is employed; whether in pasture, in husbandry, or both?

A. Generally in husbandry; cattle fed on chaff or rice straw; but under the Rotas Hills a good deal of pasture and jungle, the latter fast giving way to cultivation: myself having cleared away about 30,000 bigahs, since I established these Indigo works.

Q. 5th. If in pasture, what grasses are cultivated? Has the Guinea grass been tried; and if so, to what extent do you think it could be advantageously introduced? Has the clover been tried, and with what success?

A. The grasses are spontaneous, not cultivated. I have tried the Guinea grass, which thrives very well; clover has not been tried, never having got seed. The fiorin also thrives well.

Q. 6th. What species of stock is kept? Whether the breeds can be improved; or whether new breeds

ought to be tried? Is there any individual in your district, who would be disposed to pay attention to improving the breed of cattle?

A. Plough cattle, few cows, and a larger stock of buffaloes and sheep. From the strong antipathy of the natives to any thing new, but principally to the want of means, no improvement has yet been made, nor could any be made with the stock in hand; but no doubt by the mixture of a new breed, say the English bull, or Hurriana, an improvement must follow. I know not of any native who has the means or inclination to undertake such; but I am myself well disposed to do all I can for the improvement of the country generally.

Q. 7th. Whether any of the land is watered; and whether any considerable extent of ground is capable of that improvement?

A. Every village possesses one or more reservoirs or embankments, *(ahurs,)* for the collection of water, generally for the watering of the rice crops; and wherever water is to be had, wells are dug for the watering of wheat and barley, sugar-cane, and opium crops, &c.

Q. 8*th.* For what particular crops is land in your district irrigated; and what is the mode of irrigation?

A. For those mentioned in paragraph 7; irrigated by means of bullocks and levers for the wells.

Q. 9*th.* If the land is employed in husbandry, what crops are cultivated?

A. The crops cultivated are Sawanh, Murrooah, Taungoon, Mukya (Indian corn), Sarah (Rice), Sahtee (Rice), Codye, Till (White Sesamum), Bord Oudya, Copass Rotah, Sun, Indigo, Coorthee, Mothie, Oord, Till (Black Sesamum), Junarah, Bujurah, Cheena, Rice, Codo, Gram, Peas, Musoor, Karow, Barley, Wheat, Kasaree, Urhur, Linseed, Toree, Surso (Mustard), Jaitooah, Cotton, Oats, Jeerah (Carraway), Dhunniah (Coriander), Mungrylah, Ujwyne (a sort of Carraway), Chunsoor, Mattee, Opium, Burrā (Safflower), Putwa, Sugar-cane.

Q. 10*th.* What is the rotation of crops?

A. All crops sown in June and July, and reaped in October, are resown with other grain, excepting Sun (hemp) lands.

Q. 11*th.* Is Indigo cultivated, and to what extent? Is cotton cultivated, and to what extent? Is sugar-cane cultivated, and to what extent?

A. Indigo is extensively cultivated from 25,000 to 30,000 bigahs yearly. Cotton extensively, but of common kind. And sugar more or less in every village, and on the increase.

Q. 12*th.* What are the peculiarities of the soils occupied by these articles?

A. For indigo mixed soil and sloping grounds; for cotton flat and clay soils; and for sugar-cane strong mixed soil.

Q. 13*th.* Have the varieties of foreign cotton been tried, and with what success? Has the Otaheite cane been introduced, to what extent, and with what success?

A. Foreign cottons have only been tried by planters, and to a very limited extent. South Sea Island promises well; but all other seeds have not vegetated. Otaheite cane has not yet been introduced, but I have sown ten bigahs of the country cane, by way of experiment, and have been pro-

mised a supply of Otaheite cane in November or December next, from the Jubbulpoor farm.

Q. 14*th.* Is fallowing practised; or is the same land applied to the same purpose, from year to year?

A. No lands lie fallow, except those for sugar-cane. The same lands are applied to the same purpose from year to year; but a rotation of crops is introduced as mentioned in paragraph 10.

Q. 15*th.* Is manure used, and of what kind? Could the system of manuring be extended, and could the natives be induced to pen their cattle, instead of using the manure as fuel?

A. No manure is used by natives, except for sugar-cane, and that generally the sweepings of villages, and the dung of sheep. I am not aware that the system of manuring could be extended amongst the natives; nor do I think that the natives could be induced to pen their cattle, or of not using manure as fuel, as each would be attended with more cost than the generality of them can afford.

Q. 16*th.* Are oxen or buffaloes commonly used; would mules not be preferable for draught?

A. Oxen generally. A few buffaloes occasionally for ploughs and hackerys (carts.) Mules though preferable for draught, would never answer for the carts in use; nor would they be well taken care of by the natives, as they pay little or no attention even to the cattle they have.

Q. 17*th.* What are the usual sorts of ploughs, carts, and other implements of husbandry? Could originals or models be procured for this Society, without much inconvenience?

A. The ploughs, carts, and other implements of husbandry, are the same as those used in Behar, Ghazeepoor, Benares, &c. &c. In the cities no doubt models could be easily made and furnished.

Q. 18*th.* What is the usual seed time and harvest, for the different crops?

A. Different crops.	*Sown in*	*Ripe in*
Sawanh,	June,	Oct. & November.
Murrooah,	ditto,	ditto.
Taungoon,	ditto,	October.
Makya, (Indian corn,)	ditto,	September.
Sarah, (rice,)	June and July,	October.

Different crops.	*Sown in*	*Ripe in*
Sahtee, (rice,)	June and July,	October.
Codye,	June,	ditto.
Till, (White Sesamum,)	ditto,	ditto.
Oord budya,	July,	ditto.
Copass rotah,	June and July,	Octr. & Nov.
Sun,	June.	October.
Indigo, June,	July, Aug. & Sept.	October.
Coorthee,	August,	Dec. & Jan.
Mothie,	ditto,	ditto.
Oord,	ditto,	ditto.
Till, (Black Sesamum,)	August,	Dec. & Jan.
Junarah,	July,	ditto.
Bujurah,	ditto,	ditto.
Cheenah, Nov. Dec.	Jany. Feby. & March,	ripe in 2 months.
Rice,	June & July,	Dec. & Jan.
Codo,	July & August,	ditto.
Gram,	Oct. & Nov.	March & April.
Peas,	ditto,	March.
Musoor,	ditto,	ditto.
Karow,	ditto,	ditto.
Barley,	ditto,	March & April.
Wheat,	ditto,	ditto.
Kasaree,	ditto,	ditto.
Urhur,	June & July,	ditto.
Linseed,	Oct. & Nov.	ditto,
Toree,	ditto,	February.
Surso, (Mustard,)	ditto,	ditto.
Copass jaitooah, (Cotton)	ditto,	April & May.
Oats,	ditto,	ditto.
Jeerah,	ditto,	ditto.

Different crops.	*Sown in*	*Ripe in*
Dhunniah,	Oct. & Nov.	April & May.
Mungryla,	ditto,	ditto.
Ujwyne,	ditto,	ditto.
Chunsoor,	ditto,	ditto.
Matee,	ditto,	ditto.
Opium,	ditto,	ditto.
Burra, (Safflower,)	ditto,	ditto.
Putwa,	August,	February & March.
Sugar-cane,	Jan. & Feb.	ditto.

Q. 19*th.* What is the extent of waste lands, and the improvement of which they are most capable?

A. The extent of waste lands only arises from the want of population, and may be said to be circumscribed to the foot of the Rotas Hills.

Q. 20*th.* What is the rate of wages and price of labour? And what are the hours at which labour commences and ceases at different seasons?

A. Ploughmen 2 rupees 8 annas (5*s.* 6*d.* sterling) per month; Dhangurs (hill coolies) 2/8; coolies 4 or 5 pice (2*d.* to 2½*d.* sterling) per day; women 3 to 2½ pice; boys 2½, 2, and 1½ pice; blacksmiths 4 to 5 rupees a month; (8 to 9 shillings;) carpenters ditto; hackery drivers 2/8; mistrees (carpenters) 7 to 10 rupees, (14*s.* to 1*l.* sterling). The hours of labour

commence at sunrise and end at sunset—one or one and a half hours cessation from labour being allowed in the middle of the day.

Q. 21*st.* Is any attention paid to draining lands, and what sort of drains are used?

A. No draining, to any extent.

Q. 22*nd.* Is any attention paid to embankments?

A. If by embankments is meant such as keep out the encroachments of rivers, there are none; but every attention is paid to the embankments *(ahurs)* for the supply of water, for the rice crops.

Q. 23*rd.* Is the country well wooded, and what sort of timber is chiefly grown?

A. In some parts well, in others but indifferently; the timber grown, consists of Mangoes, Mowah, Jamoon, Kuthur, (jack) Seeso, Babool, Upog, Tar, Goolur, Kujoor, (dates) Neem, Imlee, (tamarind) Seeris, Samur, (cotton) Bamboos, Kurrum; in the jungles grow Khurhur, Sakho, Sanun, Panun, Ruhoa, Taind, (ebony) Doodhia, Dhamin, Sale, Cehyr, Kurasun, Chundun, Rukut Chundun, Taj, Sidh, Asun, and Bamboos.

Q. 24th. What is the state of the roads?

A. The roads are very indifferent, and most of them always impassable for carriages, notwithstanding the district pays one per cent. as its assessment for their support, and these are only smoothed once in the year.

Q. 25th. Is the district intersected by streams?

A. The district is bounded by the Carumnasa, the Ganges, and the Soane. The interior streams, or nullahs, have water only during the rains.

Q. 26th. Is land, or water carriage resorted to, for the conveyance of produce?

A. Generally land carriage, except on the banks of the Ganges.

Q. 27th. To what extent have manufactures or commerce been carried on in the district, and have they had good or bad effects on its manufacture?

A. There is little commerce or manufacture in the district, saving that of Indigo, which has been of the greatest advantage, inasmuch as zumeendars and ryots are enabled to get funds from the planters upon more advantageous terms than they

could from the native bankers; whilst lacs and lacs of rupees are disseminated to the working poor, and this may be said generally of all Indigo districts; and on a reference to the Collector's records, fewer villages, so situated, will be found to have been put up for sale, than those otherwise situated. Not one has been sold in this immediate neighbourhood since the works were established.

Q. 28*th.* If a manufacturing district, what proportion of the population has been thrown out of work, by the cheaper imported European Cottons; and have they taken to any other employment?

A. The only manufactures are Indigo and Paper, and the introduction of English Cotton can have had no deteriorating effect.

Q. 29*th.* Are there any other societies instituted in the district for the improvement of agriculture?

A. None.

Q. 30*th.* Do the natives seem to have a turn for improvement; or how could such a spirit be best excited?

A. None; but as there are now so many different

kinds of grain and oil seeds exported from India, the demand itself will produce an improvement.

Q. 31*st.* Are there any obstacles to improvements; and in what manner can they best be remedied?

A. None.

Q. 32*nd.* Is there any individual who could favour the Society with a rough map of your district, subdividing the lands by colours, in reference to the portions cultivated by particular crops; say blue for indigo, brown for sugar, yellow for rice, green for pasture, white for waste lands, and so on?

A. I am not aware of any individual who could favour the Society with a rough map of the district, subdividing the lands by colours, as no two crops are consecutively sown in the same lands, except rice; but the annual extent of each crop can be ascertained from the Collector's office.

Q. 33*rd.* What are the names and address of those who are the most active, or the most skilful improvers in the district; and who are the most likely to be the most useful correspondents of the Agricultural and Horticultural Society of India?

A. Mr. J. P. Marcus, Nansagur; Mr. G. Leyburn, of Nonore; Mr. Gibbon, of Shahpoor, and the humble services of myself.

Q. 34th. Could any number of influential native landlords, or farmers, be induced to join a Branch Society in your district, and to promote its objects by personal exertions?

A. I fear not. The Rajah of Doomrong and the Baboos may subscribe their names to the thing; but would take no personal interest in it.

R. H. MATHEWS.

DEARIE SHAHABAD,
25th March, 1837.

Bengal.—*(continued.)* DACCA.

From MR. DEARMAN, *late Deputy Collector at Dacca, to* DR. SPRY, *Secretary to the Agricultural and Horticultural Society of India, dated November 9th*, 1839.

MY DEAR SIR,

In forwarding the accompanying Statement, relative to the culture of the agricultural crops of the

Dacca district, together with some remarks thereon, it is with the conviction that it conveys but very limited information regarding them, and in some instances, may perhaps, to a trifling extent, be incorrect. The statement and remarks will not however be altogether valueless, should they prove a means of stimulating others, residing in the Moffussil, to follow out a plan more comprehensive and detailed.

I forward, to you also, at the same time, a similar statement to that above alluded to, in Bengallee, which may be of service, and save trouble to those who have not a good knowledge of the language; but are nevertheless willing to promote the objects of the Society; as by it, they may point out to any intelligent native who can read, the kind of information desired.

It has been my intention to collect and arrange some information in a tabular form, regarding the indigenous vegetables of the district, as also of its fruits, which if you think likely to be of any service, I will forward when completed.

I will send you some seeds from a tree, which resemble chesnuts. One of these seeds, after taking off the shell, being stuck on the point of a penknife

and lighted at a candle flame, will burn without the least odour for four or five minutes, giving a light equal to two or three candles. From the flower of the tree, I am told, is distilled a delightful scent.

Your Society have, I hear, offered a sum of — rupees for the best treatise on Indian Agriculture.* To write an Agricultural history of the crops within the limits of this Presidency, would be a gigantic undertaking, and scarcely within the power of any individual's leisure and personal knowledge to accomplish. Each district has frequently crops more peculiarly its own, whilst the process of culture and time of sowing in any two Zillahs, may differ considerably, even for the same description of crop; but were the Moffussil Members of your Society, or any others so inclined, they might each furnish an article on the culture of one or two kinds of produce grown in their respective districts. In this way the object could be easily and speedily obtained; every Zillah thus possessing a separate record of its own, the whole might form an Encyclopœdia of the Bengal presidency's Agriculture.

(Signed) T. A. DEARMAN.

* Prizes are no longer offered by the Agricultural and Horticultural Society of India for treatises on Indian Agriculture.—H. H. S.

Agricultural crops grown in the district of Dacca.	*Commencement of sowing, and to what date it may be continued with probability of realising a good crop.*	*Description of land, best adapted for the crop.*	*Quality of the land best adapted for crops.*	*Manner of sowing.*	*Quantity of seed sown per Bega, measuring 80 by 80 cubits.*	*Time of harvest.*	*Quantity of produce per Bega in a favourable season.*
1 Rice. Ouse and Aumon, (varieties so called.)	On Jeel (Marsh) lands all Maugh (January) and Choitro (March) ; on higher lands Falgoon (February) and Bysak (April,)	Jeel (Marsh) lands and churs (alluvion) yearly inundated,	Muteal, black (Marsh) jeel earth. Churs (alluvion) with but slight mixture of sand,	Plough and sow broadcast,	16 Seers,	Ouse in Justhee (May) and Assar (June,) Aumon in Kartook (October) and Augran (November,)	10 to 12 maunds, or from 800 to 1200 lbs.
2 Cotton,	All Kartook (October) and Augran (November,) as the moisture may be found sufficient to support the plant until a fall of rain,	Land not inundated, or even approaching to it, previous to the end of Bysak (April,)	Muteal earth and sand,	Plough and break the earth very fine, then plant thickly in rows, a cubit apart,	1½ to 2 Seers,	Commences in Falgoon (February,)	2½ to 3 maunds, of Kapass, (cotton with seed) or from 200 or 240 lbs.
3 Dhoneah, (Coriander,)	Ditto,	Ditto,	Ditto,	Ditto,	1 Seer,	Ditto,	3½ to 4 maunds, or from 280 to 320 lbs.
4 Bandonee,	Ditto,	Ditto,	Ditto,	Ditto,	1 Seer,	Ditto,	3 maunds, or 200 lbs.
5 Teel, (Sesamum,)	Maugh (January,) Falgoon (February) and a few days in Bysak (April,)	Moderately high land, as regards inundation,	Ditto,	Ditto,	1½ Seer,	Choitro (March) Bysak (April) and Justhee (May,)	4 maunds, or 320 lbs.
6 Sugar-cane,	In Pouse (December) and Maugh (January.) The canes intended for planting, are put in moist places by the banks of tanks, or borders of jeels (marshes) ; and from whence they are removed and planted out after the first good shower of rain in Falgoon (February,) and the planting may continue all Choitro (March.)	Land not liable to inundation,	Muteal.	Ground manured, well cultivated, and the cuttings planted in rows,	Two thousand plants or cuttings,	Middle of Augran (November) all Falgoon (February) and part Bysak (April,)	6 to 7 maunds of Sugar, or from 480 to 560 lbs.

Agricultural crops grown in the district of Dacca.	*Commencement of sowing, and to what date it may be continued with probability of realising a good crop,*	*Description of land best adapted for the crop,*	*Quality of the land best adapted for crops*	*Manner of sowing.*	*Quantity of seed sown per Bega, measuring 80 by 80 cubits.*	*Time of harvest.*	*Quantity of produce per Bega, in a favourable season.*
7 Chena, (Panicum Miliaceum)	All Pouse (December) and Maugh (January,)	Both low and high land,	Ground, ¼ sand,	Plough and sow broadcast,	1¼ Seer,	All Choitro (March) and Bysak (April) and part Justhee (May,)	4 maunds, or 320 lbs.
8 Kayen,	Ditto,	Ditto,	Ditto,	Ditto,	1 Seer,	Ditto,	3 to 4 maunds, or 240 to 220 lbs.
9 Moog,	All Pouse (December,) Maugh (January,) and Falgoon (February.)	Ditto,	Black earth,	Ditto,	1¼ Seer,	Ditto,	4 to 5 maunds, or 320 to 400 lbs.
10 Mash kallye, (Phaseolus Radiatus,)	Assween (September) and Karteek (October,)	High land that has been inundated,	Muteal and also mixture of sand and earth,	Rough ploughing and also broadcast,	1¼ Seer,	Falgoon (February) and Choitro (March,)	4 to 5 maunds.
11 Motor Dael, (Pisum Sativum,)	All Karteek (October) and part of Augran (November,)	As the water receeds from the rice fields, this pulse is Chetowed amongst the yet uncut rice crop,	See rice,	broadcast,	6 Seers,	Half Falgoon (Febraury) and Choitro March,)	4 to 5 maunds, or 320 to 400 lbs.
12 Kasharee Dael (Lathyrus Sativus,)	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	4 to 5 maunds, or 320 to 400 lbs.
13 Lal Soorsah,	Ditto,	Ditto,	Ditto,	Ditto,	1½ Seer,	Ditto,	3 to 4 maunds, or 240 to 320 lbs.
14 Soorsah,	All Karteek (October) and Augran (November,)	Both high and low lands,	Muteal; new churs (alluvion) not very sandy.	Ploughing and also broadcast,	1½ Seer,	Ditto,	3 to 4 maunds, or 240 to 320 lbs.
15 Set Soorsah,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	3 to 4 maunds, or 240 to 320 lbs.

Agricultural crops grown in the district of Dacca.	*Commencement of sowing, and to what date it may be continued, with probability of realising a good crop.*	*Description of land best adapted for the crop.*	*Quality of the land best adapted for crops.*	*Manner of sowing.*	*Quantity of seed sown per Bega, measuring 80 by 80 cubits.*	*Time of harvest.*	*Quantity of produce per Bega in a favourable season.*
16 Moosoree Dael, (Cicer lens,)	All Karteek (October) and Augran (November,)	Both high and low lands,	Muteal; new churs (alluvion) not very sandy,	Ploughing and also broadcast,	2½ Seers, or 5 lbs.	Maugh (January) and Falgoon (February,)	4 to 5 maunds, or 320 to 400 lbs.
17 Sun Pat, (Crotalaria Juncea,)*	All Falgoon (February) and Choitro (March,)	Rather low and middling high lands,	Muteal, and also with a small mixture of sand,	Ploughing,	2½ Seers, or 5 lbs.	Shrabun (July,) Bhadro (August, and Assween (September,)	20 maunds, or 1600 lbs.
18 Masot or Mesta Pat, (Hibiscus Cannabinus,) Syrian Mallow	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,
19 Ginger,	All Falgoon (February) and part of Bysak (April,)	Land not liable to be inundated,	Muteal,	The land to have a good top dressing with earth taken from bottoms of tanks, jeels &c. well ploughed, planted in rows one cubit apart, and the plants half that distance.	2½ maunds, or 200 lbs.	Augran (November) and Choitro (March,)	8 to 10 maunds, or 640 to 800 lbs.
20 Turmeric,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,	Ditto,
21 Tobacco,		Moderately high lands and not unfrequently on lands that would be inundated in Shrabun, (July,)	Muteal as a basis, with a good depth of vegetable mould above,	Highly manured with decayed vegetable matter, plant out in Pouse (December) and Maugh (January) in rows, one cubit apart, allowing the same space between each plant,	6400 plants,	Bysak (April) and Justhee (May,)	4 to 5 maunds, or 320 to 400 lbs.
22 Indigo. Too well known, to be further noticed.	—	—	—	—	—	—	—

* According to Dr. Taylor the District of Dacca in 1806 yielded 10,000 maunds, or about 370 tons of the article.—H. H. S.

Remarks on No. 1.—There are numerous varieties of the Ouse and Aumon rice, the former is sometimes sown alone, but the latter very seldom; when sown together, as is most frequently the case, the proportion of seed is three parts Ouse to one part Aumon. The produce is, however, different to what might be expected, the former yielding only four or five maunds, and the latter six or seven ditto. The Ouse continues on the field four to five months; the Aumon eight or nine; and very soon covers the space, by vigorous tillings, which was previously occupied by the Ouse.*

Remarks on No. 4.—This crop is often sown with Aumon. I have been told by natives, that the white Teel, (Sesamum,) is occasionally grown in this district. I have never yet met with it, and imagined it was only produced in the Upper Provinces, where it is used as an article of food; chickny and cakes made of this seed, well flavoured with assafœtida, is considered by the natives quite a *bonne bouche*.

* Of all the kinds of rice, the Aumon is the most rapid in its growth. Dr. Taylor (Topography of Dacca) mentions, that it frequently shoots up to the extent of twelve inches in twenty-four hours, and attains, in the course of some seasons, a height of fourteen feet.—H. H. S.

The white Teel being of much more value as an article of commerce, it would, I think, be worth trying in this district. The difference of freight alone between this part of Bengal and the Upper Provinces to Calcutta, would give a handsome profit, and without costing the cultivator more than he at present lays out in the growth of an inferior kind.

Remarks on No. 6.—The quantity of Sugar obtained from a bega* of the Dacca cane, (7 maunds, or 560 lbs.) appears to me small; the plants are however very poor, although the adjoining districts of Fureedpore and Mymunsing produce, I believe, the finest within a circuit of many miles. The two kinds most esteemed in the above districts, are the Kajlees and Dhol Sindooree; the former of a black or very deep purple colour, the latter a pink. There is a patch of these kinds in the Dacca garden, and they appear to have the advantage over the Otaheite and Munnipore, in not throwing out shoots from the joints, whilst growing.

* There are two, if not three, begahs in use in the Dacca district, viz. one of 100 cubits square, equal to 2 roods, 2 perches and 179¼ feet; the second, as laid down by Mr. Dearman, in this paper and is 80 × 80 cubits; the third is 100 × 80 cubits.—H. H. S.

Remarks on No. 11.—This is the same as our field pea in England, indigenous no doubt; but far inferior to the European kind. On churs (alluvion) sufficiently dry for sowing on the 1st November, after ordinary inundations, and on which there has been an alluvial deposit, with but little sand, I think a profitable cultivation might be made of the kinds used for splitting, or such as are quoted in the English price current as "Boilers;" a slight ploughing and broadcast, or even chetowing,(?) would I think answer—and if successful, a superior article of food would be obtained for the natives, or for exportation to Calcutta, where they would probably find a good market for supplying the shipping.

Remarks on No. 13, 14, and 15.—Where these crops succeed best, with a little more care and attention, our English mustard seed might answer equally well, and to a limited extent prove a valuable article of export. Rape seed might also be tried.

Remarks on No. 19.—There is but little ginger grown in this district. Rungpore is the favoured locale, I believe. What most materially contributes towards giving the West India ginger a higher value over that of the East, arises from the different preparation it undergoes. In this country, the

roots when taken up are put into boiling lime water, which probably destroys much of the fragrant pungency, as well as the vegetative power. In the West Indies, the roots are washed in cold water, the rind carefully scraped off, they are then dried on mats in the sun. The West India mode of preparation might be worth trying.

With regard to the following mentioned crops; 1. safflower; 2. paun leaf; 3. wheat; 4. barley; 5. gram; 6. kally jeerah, (Nigella Indica or Sativa.) The first is grown extensively,* the second not to any great extent, at least in the Dacca district; the remaining four very partially, they are however all cultivated more largely in the adjoining districts of Fureedpore and Mymunsing. I have not as yet made many inquiries about them.

* The annual average quantity of Safflower, according to Dr. Taylor, exported from the district of Dacca for eight years past, has amounted to about 4,000 maunds, or about 149 tons. The total quantity that passed the Calcutta Custom House in 1824-25, (the greatest year of exportation ever known,) was 8,448 maunds, or about 316 tons.—H. H. S.

Bengal.—*(continued.)*

From Mr. Robert Ince, *late Secretary to the Barrisaul Agricultural and Horticultural Society, to* Dr. Spry, *Secretary Agricultural and Horticultural Society of India, dated Barrisaul,* 18*th February,* 1840.

Sir,

Absence from the station on public duty, together with the wish to gain every information in my power on the subject of your letter of the 29th October last, has been the cause of my not having replied to it ere this. I now do so with considerable diffidence, and must therefore trust to your indulgence.

Food, comprising Grains of all kinds—Medical Plants, Fruits, and Roots.

Grains.—Rice, Dhaul of various kinds, consisting of Kissauree,* Moong,† Mussooree,‡ Bhoot,§ Mauskullye‖ and Urrur.¶

* Lathyrus Sativus. † Phaseolus trilobus. ‡ Cicer lens.
§ Cicer arietinum. ‖ Phaseolus radiatus. ¶ Cytisus cajan.—H. H. S.

Vegetables.—Brinjahls, Turryes, Ramturryes, red and various other Saugs, Radishes, Seem of various kinds, Jingahs, Kurralahs, Pulwul, Chillies, Pumpkins, and Cucumbers.

Roots.—Kutchoo, Yams, Sweet Potatoes, Ginger, Turmeric, Onions, Garlic, and Arrow-root.

Fruits.—Mangoes very inferior, and never to be had without insects in them; Jacks, Cocoanuts, Limes and Lemons, from the small juicy Kagzee to the large Lemon nearly the size of a Citron; Shaddock, Tamarind, Chulta, Kumrunga, Jaum, Kow, Lutkun, Gauva, Hurfurrowree, Aumrah, Autah phull, similar to the Custard Apple, and sold in Calcutta under the name of "Bull's heart" I believe; Aumluckee, an acid fruit; when dried, I believe it is sold in Calcutta under the name of Reetah, Jullpye or Olive, Melons, water and musk, but very small and inferior. There is also the small kind of long musk Melon, called Phoot, common throughout the country.

Manufacturing and Commercial Articles, such as Oils, Gums, Dyes, and Barks, or any other known or unknown staples of commerce, such as Oak, Fir, Teak Tree, &c.

Oils.—Cocoanut, Mustard, Teel, and Castor Oil.

Trees.—Soondry, Pussoor, Singarah, Byne, Kulsee, Keurah, Kunkra and Ihien.

Fodder and Food for cattle and domestic animals, comprising Grasses, Seeds, Fruits, Roots, and Leaves, also any ornamental Shrubs and Flowers.

The only food the cattle have in this district, is the stubble after the different grains are cut. I am not aware of any grasses, ornamental shrubs, or flowers peculiar to this district,

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Grains.—Rice is the principal staple of this district; it is of various kinds. Of Dhauls, the Kassauree and Mauskullye are the most common.

Vegetables.—The most cultivated are the Radish, Chilli, Cucumber, and Pumpkin. I have this year

distributed some Guinea grass and Turnip seed, but it required some persuasion to induce this people to take it.

Roots.—The Kutchoo is most generally cultivated; the Yam requires but little attention, and is to be had at most *hauths,* (markets) when in season; the Turmeric is good, and requires no improvement; the Ginger is small, and might be improved in *appearance;* but whether it would be actually so in the opinion of the natives, is a question, as I believe the larger kind is not so pungent; in that case it would not be preferred, as from the poverty of their food, they require stronger stimulants.

A short time ago, I offered some of the long Nepaul Chilli, but it was objected to, from not being so *hot* as the common kind; the same objection exists regarding the large Patna Onions. The year before last I distributed some of the Tenessarim Yams, which still exist, and are I hope likely to increase.

The Arrow-root is very common, growing in almost every jungle,* and Mr. Golding mentions, that

* Query—not a true root? Dr. Taylor, in his Topography of Dacca, speaks of the bulbous root of the Egyptian, or Nymphæa lotus, yielding a fecula or starch, which the native medical practitioners of the district which adjoins Barrisaul, use as a substitute for arrow-root.—H. H. S.

he has seen it prepared, and that it is very little inferior to the West India, and he thinks, if cultivated, would be equal to it.

Fruits.—I believe those I have enumerated are common throughout the Lower Provinces, perhaps under different names, with the exception of the Jullpye, or Olive,* which I have never before met with; it is common throughout these lower districts, and grows to a considerable size. I have cultivated a few young plants, which I will take the first opportunity of forwarding to the Society; it appears a hardy plant, and requires but little care.

Sugar-cane.—This is cultivated to a considerable extent, and may be considered one of the staples of the district; but the smaller appears to be preferred to the larger kind sent by the Society last season, for although more juicy, it is not supposed to contain so much saccharine matter.†

Mustard—Is cultivated, but limited, and is very inferior to that of the other parts of Bengal; the Teel is also much smaller.

Cotton.—This is cultivated to some extent, but

* Not the true Olive, but Elæocarpus serrata.—H. H. S.

† Where this occurs it is the fault of the people in not thrashing the Canes sufficiently.—H. H. S.

not sufficient for the demand; it is the small annual plant, common throughout Bengal. I offered the different kinds sent by the Society, but they were refused, the land being required for rice, which they consider the more profitable cultivation; they assign a further reason for refusing,—that the Cotton offered to them not being an annual, would occupy the ground from which they now obtain various productions during the year; and Rice being the principal staple of the district, it is of course more thought of; nor is it to be wondered at when the natural indolence of the native is considered, and the trifling labour required for its cultivation; for in this district it may almost be said to be a spontaneous production. I fear but little improvement can be expected from the introduction of any new cultivation, without more European settlers. The Zemindar is but seldom a resident on his estate, and even when he is, he thinks only of how he can best manage to get the most out of his *ryots*, and so long as he gets enough, he is contented with the old system.

The fruits are generally so inferior, it is a question whether they would be worth the trouble and expense of transport, even admitting the certainty

of success. The Beetle-nut might be turned to advantage if it would live in England; it requires care and shelter for the first three years, after which it is a hardy tree; it bears the fifth year, and no doubt its fruit might be turned to better advantage, than being a mere accompaniment to Pawn, which is the only use made of it by the natives, and for tooth powder by the Europeans; the husk is an excellent TAN, and is frequently made use of by the *Chumars* (curriers) for preparing their leather.

Trees.—The Soondry takes the lead, it grows to an immense height and girth in the jungles about the Hurringattah, and other large rivers. The timbers brought to the different marts, seldom exceed 14 and 15 feet in length, and from 3 to 6 feet in circumference; they are used principally for boat-building, as it is liable to warp and crack when exposed; it makes the best charcoal, and is preferred as fire-wood. The Pussoor is a dark, heavy wood, and beautiful for furniture; small trees are generally brought in for house posts, as it is considered to last so much longer than any other wood; it is not liable to rot, and withstands the attacks of white ants, but the posts are generally very crooked.

The Singarah (Nyctanthes arbor tristis), I have not yet been able to obtain of any size; but the appearance of the tree and the wood, is very like Mahogany. The other trees are used merely for fire-wood and posts, and seldom grow to any considerable size.

Should I hereafter meet with any information worth communicating to the Society, I will again do myself the pleasure of addressing you.

(Signed) ROBERT INCE,

Secretary, Barrisaul Agricultural and Horticultural Society.

ORISSA AND BENGAL.

From ANDREW MILLS, ESQ. *Commissioner at Cuttack, to* DR. SPRY, *Secretary to the Agricultural and Horticultural Society of India, dated February* 26, 1840.

DEAR SIR,

I am sorry to say, that I can give you little information respecting the trees, &c. of this district. I know little of the climate and soil best adapted to either European or Indian trees, to venture an opinion on the subject. As far as I have seen, there are no other trees here that are not common to other parts of India; but the following are considered worthy of extension by Dr. Cumberland of Pooree, who is more conversant than I am with these matters, the particulars concerning which, were kindly supplied to me by that gentleman.

"Calophyllum inophyllum, called by the natives *Pulang*, or *Punang*, flourishes luxuriantly on poor sandy soils, in fact where scarcely any thing else will grow. It is a very beautiful, and at the same time an useful tree. The oil which is procured from the berries is used for burning, and likewise for medicinal

purposes. The wood is soft, and only used for firing. Whether this tree would grow beyond the influence of the sea-breeze, I know not, but it is worthy of experiment; and I believe you have them in the neighbourhood of Cuttack, which is a considerable distance from the sea, but scarcely beyond the influence of its breezes. There is a large plantation of Pulang trees at Satparrah; they were planted by Mr. Wilkinson on account of Government on some waste lands in that neighbourhood, and will, in a few years more, yield a very handsome return on the original outlay.

"Anacardium occidentale, (cashew-nut,) called by the natives *Nonkar Ambo*. Like the Pulang this tree delights in a poor sandy soil, and is found growing wild. I have been informed, that in some parts of the Madras territories, where the trees abound, many lives have been saved in times of famine, by the people subsisting on the cashew-nut. Query, might not the convicts be usefully employed in extending the cultivation of these trees on waste land? The plants would require no care when they had once taken root, save a fence to protect them from cattle, while young. The cultivation of the cashew-nut is never likely to be effected by the

ryots, as the returns would be far too small to afford a remunerating price for their time and labour. The wood of the cashew-nut tree is only used for firing. An oil is produced from the inner shell of the nut.

"Sanseviera zeylanica, called by the natives *Moorgabi*, grows wild in various parts of the district, chiefly in hedges. It is perhaps worthy of being extensively cultivated for the sake of the extremely strong fibres or flax, afforded by the leaves. With the exception of the *Ootralee*, it is perhaps the strongest vegetable fibre known; almost every soil seems to suit it. Mr. Bond of Balasore, can give you further information about the *Moorgabi*, as it was he who first brought to my notice the flax procured from that plant; it has however been long known to the natives. The hill people manufacture their bow-strings of these fibres; fishing lines are also made of them. Mr. Bond of Balasore, has manufactured good rope from this flax, and brought the subject to the notice of the Marine Board.*

* On inquiry I find that experiments have been made at the Government yards of a most satisfactory nature; but the expense of collecting the fibre in quantities, appears to be the chief difficulty in bringing it into extensive use.—H. H. S.

"There is a species of Asclepias, called by the natives *Ootralee*, and *Bydunka*, which grows in the hedges of this district. The bark of the young shoots yields a very fine, and exceedingly strong silky fibre, similar, I imagine, to that described by Roxburgh as the production of Asclepias Tenacissima. The *Ootralee* is the strongest vegetable fibre I have ever met with. It might be worth while to cultivate the plant for the sake of its fibre.

"Dillenia speciosa, called by the natives *Chalta*, is occasionally found growing wild on indifferent soils. It is a very beautiful tree, and the fruit is eaten by the natives. The wood is hard and tough, but I cannot find that the native carpenters make any use of it."

(Signed) A. MILLS.

Bengal.—*(continued.)* BEERBHOOM.

From H. WALTERS, ESQ., *Commissioner, to* JOHN BELL, ESQ. *late Secretary to the Agricultural and Horticultural Society of India, dated Calcutta, 8th May,* 1837, *giving cover to information drawn up by the Rev.* MR. WILLIAMSON, *Missionary, on the district of Beerbhoom.*

I have the pleasure to forward answers to the queries circulated by the Agricultural and Horticultural Society, drawn up by the Rev. Mr. Williamson of Beerbhoom.

A letter from Dr. Furnell, Officiating Secretary to the Beerbhoom Branch Society, states as follows:—

"The Coffee plants obtained from Dr. Wallich arrived safe, and are thriving well.

"Guinea grass is growing in Mr. D'Oyly's garden luxuriantly, and he intends increasing the quantity, and distributing it to all applicants.

The Georgia and Sea Island Cotton seed has vegetated, and appears to be doing extremely well. Some of the plants have large flowers. About a biggah of garden has been sown with the Cotton seed; and a quantity has been distributed."

(Signed) H. WALTERS.

From the Rev. MR. WILLIAMSON, *Missionary, Beerbhoom.*

Replies to various queries proposed by the Agricultural and Horticultural Society, chiefly communicated by native farmers.

1st.—The district of Beerbhoom is higher, and less level, than the more southern plains of Bengal, and that portion of the Zillah which extends to the north-west, is mountainous and woody. As spontaneous vegetation in a great measure ceases from the termination to the commencement of the rains, the soil, and perhaps the atmosphere too, must I conceive be more dry than in other places, where this does not take place, at least to the same extent. Hot winds also generally prevail more or less during the months of April and May; the extremes of heat and cold seem to be greater here than in Calcutta; the usual range of temperature during the cold and hot seasons, being from about fifty to hundred degrees of Farenheit in the shade.

The natives inform me that there are six varieties of soil in Beerbhoom—First, what they call Belia, or sandy soil. Second, that denominated Metial, or

clay soil. Third, Kankoria, or gravelly soil. Fourth, Poloo, or muddy soil, chiefly found on the banks of rivers. Fifth, Barthoo, existing where mud-walled villages or houses have formerly stood. And, lastly, Etial, or more adhesive clay than the Metial above-mentioned. The last four varieties exist in much smaller proportions than the two first. The Belia variety is the most abundant.

2nd.—The great land proprietors of this district are not numerous; the same may be said of very small proprietors; most of the Zemindars here belonging to the middle class, or those who may possess from ten to twenty villages.

3rd.—The farmers in this part of the country seldom occupy more than 100 biggahs of ground, which may require about seven or eight ploughs. A much greater number, however, cultivate only one-half that quantity. But the most numerous class of farmers is composed of those, who cultivate from ten to sixteen biggahs only, which they endeavour to manage with only one plough.

4th.—The south-east portion of this district is principally occupied in husbandry; but the lands to the north and west being jungly and mountainous, are chiefly employed in pasture.

5th.—No particular grasses are cultivated in Beerbhoom; neither the guinea grass nor clover has yet been tried.

6th.—The principal article of stock is cows; next to them, in some parts, buffaloes; then goats, sheep, pigs, &c. A few ducks and geese are also reared by some, and many fowls, particularly in the jungles. I have no doubt that the breeds that are in use might be improved, and that new breeds ought to be tried, though I am not at present aware of any individual who would be disposed to pay particular attention to the breed of cattle.

7th.—Nearly one-half of the lands in cultivation are watered from tanks and rivers, chiefly from the former; some of those not watered are capable of this improvement, and would be much more productive were good tanks dug in their vicinity. The chief objection to this improvement is, the want of funds.

8th.—Rice, Cotton, Sugar-cane, Kochoo, Begoon, Radishes, Wheat, &c. are all irrigated when required. Several methods of irrigation are used in this district; but the one most commonly practised, is that of raising the water of tanks by means of an instrument called a *doonee*. It is, I believe, gene-

rally constructed from the trunk of a mango tree, is about nine cubits long, and in shape somewhat resembles a canoe. One end is lowered and raised alternately by two men; to assist them in raising again the end which has been lowered into the water, a rope is attached to it and to the end of a beam, which is elevated and balanced on a forked stake; to the further end of this beam a quantity of earth is suspended, and by weighing it down, raises the end to which the extremity of the *doonee* is attached. Another three-cornered instrument, made of split bamboos, is also used for elevating the water of tanks. It is alternately let down and raised full of water by means of ropes attached to it, and held by two men on each side of the gutter; and by having troughs elevated one above another, water may be raised to any height required. Sometimes, particularly from rivers, where the bank is high, water is elevated at once to a considerable height, by means of an instrument called a *tera*. This is an earthen vessel, tied to a bamboo or pole, which is attached to one end of a beam, considerably elevated, to the further end of which a weight of stones or earth is suspended; several men (about four or five) are required to work this ma-

chine The quantity of water raised at each elevation of these different instruments, may be from about one maund to a maund and a half.

9th.—Rice is the chief production. Sugar-cane, Cotton, Wheat, Teel, (Sesamum,) Kalai, a species of Dolichos, Indigo, &c. are also cultivated in smaller quantities.

10th.—In some very good lands, Wheat, &c. is sown after the Rice crop has been reaped. But in general only one crop is raised during the year from the same lands. Rice is sown on the same grounds from year to year, but Sugar-cane, Cotton, and Teel, &c. are changed.

11th.—Indigo, Cotton, Sugar-cane, &c. are all cultivated in this district. A small farmer cultivating twelve biggahs of ground, would probably allot only one biggah to each of the above articles.

12th.—For Indigo, poloo and bastoo soils are preferred. For Cotton, metiel; and for Sugar-cane, bastoo, belia, &c.

13th.—No kinds of foreign Cotton have as yet been tried, nor has the Otaheite cane been introduced.

14th.—Except for Teel (Sesamum) and (a species of Dolichos) Kalai, which are sown on high lands, fallowing is not practised here.

15th.—Manuring is uniformly practised; cow-dung and tank mud are generally used, chiefly the former. Some people pen their cattle.

16th.—Oxen and buffaloes are both used, chiefly oxen. The natives know nothing of mules, and would probably feel a prejudice against them, as they do against the employment of asses.

17th.—As the various implements of husbandry used in Beerbhoom, hardly differ in any respect from those used in the other districts of Bengal, a particular description of them would appear unnecessary. If required, either originals or models might be procured without much inconvenience or expense, the whole, even of the best description, not amounting to more than ten rupees.

18th.—Rice is sown from the middle of May to the end of June. It is transplanted from the 1st of July to the 15th of August; and with the exception of Ouse, which ripens early, is reaped from the middle of November till the middle of December. The Sugar-cane is planted in May. The harvest lasts from the 15th February to the 15th March. Cotton is sown from about the 1st till the middle of October; the harvest continues from about the 1st of May till the 12th of June. Wheat, Barley,

Mustard, and Kolai, are sown from the 12th October till the 12th of November; they are reaped in all March.

18th.—Taking the whole of Beerbhoom, nearly two-thirds may be reckoned waste lands, and about the third cultivated. The waste lands lie chiefly to the north-west; the improvement of which they seem most susceptible, is cultivation where water can be obtained.

20th.—Four pice a day, and food amounting to about two pice more, is the usual rate of wages in this district; labour generally commences about sun-rise, and continues till about ten o'clock, when, after ceasing for refreshment one hour or a little more, it re-commences, and is continued till three in the afternoon, at which period about one hour and a half is allowed for dinner; after which the labour is again resumed till sun-set. During the hot months, when the day is long, the periods allotted for food and relaxation are somewhat exceeded.

21st.—Draining is hardly practised in Beerbhoom; only small drains are used in some few places, for Sugar-cane, Kuchoo, &c. during the rains.

22nd.—There are embankments on the edges of the Ojoy and Mourak rivers, in various places; but

I am not aware of there being any on the sides of any of the smaller streams.

23rd.—The north-west portion of Beerbhoom being jungly, and but very partially cultivated, is abundantly supplied with fire-wood and timber of various kinds. The kinds chiefly used, and which grow spontaneously are, Sal, Murgha, Sutsar, Abloos, &c., those principally cultivated are, Mango, Tal, Babla, Suruoh, Orgoan, &c.

24th.—With the exception of the roads leading from Soory to Moorshedabad and Burdwan, most of the roads in this district are nearly impassable to all except oxen and foot passengers.

25th and 26th.—The Ojoy river, which separates Beerbhoom from Bancoorah and Burdwan, is a considerable stream. Also the Mourak, which passes through Beerbhoom. The district is also intersected by several smaller streams. Neither the Ojoy nor Mourake rivers are navigable, except for a few days occasionally, during the rains, so that water-carriage is hardly resorted to for the conveyance of produce.

27th and 28th.—This district has never been remarkable either for its manufactures or its commerce. Both however have been, and are still, carried on to

a considerable degree, though to a less extent than formerly. The chief articles of produce and manufacture in this district are, Rice, Sugar, Indigo, Silk, Tussur, Cotton piece goods, and Iron, &c. A considerable proportion of these are exported. The principal articles imported are, Salt, Spices, Tobacco, Cotton, Potatoes, &c. Some of the exports have no doubt had a beneficial effect on agriculture. This district being more an agricultural than a commercial or manufacturing district, the proportion of people who have been thrown out of work by the cheaper imported European cottons, though considerable, is not so great as in some other districts.

29th.—Besides the Branch Society lately instituted here by Mr. Walters, there are no other institutions.

30th.—The natives of this country, it is well known, have no great turn for improvement. Such a spirit, I conceive, would be best excited, by convincing them of the advantages.

31st.—The religion, ignorance, and general poverty of the natives are, I should think, among the chief obstacles to improvement, and if such be the case, these obstacles will no doubt be best removed by endeavouring to teach them, and if possible, to

render their condition more happy by beneficial laws.

32nd.—I am not aware of any individual who could favour the Society with an agricultural map.

33rd.—Besides the civilians at this station, there are only two Europeans resident in this district.

34th.—Some have already joined the Branch Society lately instituted here, and several others will no doubt be induced to do so bye and by.

From G. A. BUSHBY, ESQ. *Secretary to Government of India, to* H. H. SPRY, ESQ. M. D., *Secretary to the Agricultural and Horticultural Society of India.*

Genl. Dept.

SIR,—With reference to the letter No. 653, from this Department, dated the 22d May 1839, I am directed to forward to you a printed copy of the list of Plants alluded to in Dr. Royle's letter of the 31st December 1838,* received from the Honorable the Court of Directors.

(Signed) G. A. BUSHBY,

Secretary to the Government of India.

COUNCIL CHAMBER,
The 23d June, 1841.

* Dr. Royle's letter in full, as well as one by Dr. Lindley, forming enclosures to a Dispatch from the Honorable the Court of Directors, will be found in the 7th volume of the Transactions of the Agricultural and Horticultural Society of India.—H. H. S.

From Professor ROYLE, M. D., F. R. S., *to* JAMES COSMO MELVILLE, ESQ. *Secretary at the India House, containing observations on the introduction into India of the useful and ornamental Plants and Seeds of Europe, and some of the Plants of North America.*

Transmission of seeds to and from India.

The advantages being undoubted, and the prospects of success great, the Court of Directors of the East-India Company determined on not allowing the opportunity, offered by the speedy Communication with India, to escape, of sending to that country the materials for growing there the plants suited to its varied soils and climate, and such as are likely to conduce to the improvement of the country, and the benefit of the people; obtaining also from its mountains such as are suited to the climate of Great Britain. The subject was brought under the notice of the Court of Directors by a despatch from the Governor-general, dated Simla, 16th August 1838, intimating that his Lordship had addressed an order to the officers in charge of such districts in the North-western provinces as are either within, or which border on, the Himalayan range, in-

structing them to collect in the autumn, suitable seeds, bulbs, and roots, for transmission overland to England.

The Governor-General, adverting to the facilities afforded by the steam communication, and referring to the interest known to be taken by the Court in increasing the vegetable riches of the two countries, expresses a hope, that such useful seeds and plants may be sent out to India, as may gradually be naturalized in that country, and recommends inquiry being made in this country for advice on the subject.

Advantages of the Transmission of the Seeds of Useful Plants to India.

On the importance of the object contemplated by Lord Auckland, and sanctioned by the Court of Directors, it is scarcely necessary to offer any remarks. So large a share of the wealth of every country is composed of its vegetable productions, and those productions in such a variety of ways minister to supply the wants of man, that to increase their number or improve their quality, cannot fail to be regarded as a benefaction to the country thus enriched.

Indebted as man is to the vegetable kingdom for food, shelter, and clothing, for the means of restoring health, and assuaging pains, the propriety of Govern-

ments promoting the introduction of valuable plants into the countries over which they rule can scarcely be questioned. In India, particularly, the duty of acting upon these views is enjoined by peculiar reasons. The productive powers of the soil will give every advantage to the attempt of those disposed to call them forth, and the people being accustomed so generally to a vegetable diet, renders it important to secure to them, as large a supply and as great a variety of such diet as possible. The occurrence of those severe visitations of Providence, by which the happiness of the people is for the time destroyed, and even the preservation of existence rendered almost impossible, calls imperatively for the adoption of any measures, such as the introduction of plants less dependent on rain, which might tend to avert such calamities, or alleviate their effects. The commercial position of India requires a large amount of exchangeable productions, and these must be raised from the soil, for it is to agriculture that India must look for the means of engaging in commerce.

Great extent to which the introduction of Plants may be carried.

Carried to its legitimate extent, the plan for the enrichment of India by such vegetable productions as are adapted to the country would be a most extensive one; for, as is observed by Dr. Lindley,

"from the great extent of the British possessions in India, and the infinite modifications and combinations of soil and climate to be found within them, there can be no doubt whatever that almost every production of every climate, except the Arctic, may be so completely naturalized, that where they are of any importance as objects of cultivation, they may be brought to all the perfection of which they are susceptible in other countries."

Recommended to be undertaken.

It has accordingly been recommended that the gradual introduction, from every part of the world, into India, of every variety of tree and plant adapted to its climate, should be an object steadily kept in view. Also, that such measures should immediately be taken as may be necessary to secure a supply of seeds for future seasons in such quantities as seem desirable, with reference to the means that may exist for their cultivation.

Despatch of the Court of Directors on the subject.

In the Proceedings of the Agricultural and Horticultural Society of India, of the 12th of June 1839, we find that the Governor-General had forwarded to the Society the despatch of the Court of Directors to the Governor-General of India, of the 13th of February 1839, together with the letters which had been written by Dr. Lindley, and the

writer of these remarks, in reference to this subject. The Court say: "We are sensible of the importance of the subject to which, in the letter under reply, you have directed our attention, and we have resolved on gradually furnishing you with the means of carrying on extensively experiments for naturalizing in India useful and desirable plants, indigenous in other countries." "We have forwarded some varieties of seeds, &c., highly important either as affording articles of food, or possessing medical virtues, and they will deserve all the attention that can be afforded them." "We shall continue at the proper seasons to send supplies of other varieties, and it is our wish that the greatest care should be bestowed, with a view to their naturalization, for the benefit of the country."

Despatch respecting the Transmission of Seeds to India;

"With regard to the collection of seeds for transmission to this country, we are of opinion, that the expediency of bearing in mind the nature of the climate to which they are to be exposed should be impressed upon those to whom the task is to be committed."

from India.

The Society, after the reading of the despatch and its enclosures, determined, in furtherance of so "useful and philanthropic an object,—that in

Resolution of the Agricultural Society of India.

Resolution of the Agricultural Society of India.

reference to the communication now read from the Honorable the Court of Directors of the East India Company, and with the view of aiding as far as possible, the intentions therein expressed, and the labours of those scientific gentlemen at home, who have so kindly interested themselves in the subject — a Committee be formed for the purpose of suggesting such plants and trees as may be thought desirable for introduction into India, and those that can be furnished in return, and that the Committee be instructed to obtain communications from the Branch Societies and other available sources throughout India."

The measures which were adopted here in consequence of the resolution of the Court it is unnecessary to particularize, as more fitting occasions may occur for entering into the necessary details. Keeping in view the necessity of obtaining the seeds of plants of different countries suitable to the different parts of India, the principle exhibited in the tables appended may serve as a guide. To obtain complete success will require only perseverance, and a systematic arrangement of the means adapted to the ends in view. The roots and seeds requiring tropical culture should be in India by the middle of June;

Times when seeds should arrive in India.

that is, at the beginning of the rainy season. Those intended for cultivation in the plains during the cold weather, should arrive in October and November, while such as are to be sown in the Himalayas need not be there before March, or even April.

The seeds obtained from various sources may be sent in separate parcels as intended for warm or for cool climates, as for Bombay, Madras, Calcutta, and Saharunpore, or for the Hills of Mahabhaleshwur, Neilgherries, Darjeeling, Mussooree, and Simla. Wherever practicable, the Botanic Gardens or their nurseries seem the most suitable situations for the first cultivation of the various seeds or plants which may be introduced, but the Gardens of the several Horticultural Societies at the Presidencies might be equally advantageous wherever they are desirous of joining in the experiment. Whenever a plant has become established, or its seed has ripened in one garden, these should be distributed to the others which have been enumerated, or to the several branch Horticultural Societies which have been established, or to individuals who are inclined to pay the requisite attention to such pursuits. The several gardens in different parts of India ought also to interchange their several

Measures advisable for adoption in India.

products, even their indigenous and long-established cultures, more freely and systematically than has hitherto been the case. Gardeners and Farmers in Europe seldom continue to cultivate from the seed constantly ripened in their own grounds, but interchange with, or purchase from others, what these again are ready to do with theirs.

Seeds sent to India,

The seeds of a great variety of plants have been sent by the monthly mail at different times to the several Botanic Gardens which have been enumerated, and latterly to the Agricultural Societies of Calcutta and Bombay. Of the measures adopted, an instance may suffice in the extract of the following letter from Monsieur A. De Candolle, of Geneva, who is following the course of the distinguished Botanist, his father.

and Bombay.

Letter from M. A. De Candolle.

" Mon cher Monsieur,

" Je viens d'adresser à Mr. Bentham une caisse qui contient différens objets pour vous. Ce sont d'abord des graines, d'espèces cultivées dans notre jardin, et de plantes cultivées en grand dans ce pays. Je ne suis pas parvenu encore à me procurer les Céréales cultivées dans les plus hautes parties de la Suisse, mais j'ai pensé que les variétés usitées dans nos plaines réussiraient peut être mieux dans l'Inde que les semences venues d'Angleterre. On estime en agriculture qu'il faut croïser les semences, c'est-à-dire semer dans un pays des blés venant d'un autre, afin qu'ils aient des qualités différéntes de celles que le climat du pays a

pu donner. C'est dans cette idée que je vous ai envoyé des céréales et des légumes communs de ce pays. D'ailleurs nos légumes du continent sont préférables à ceux de l'Angleterre, et leurs graines sont plus mures. Une autre fois je pourrai probablement vous donner des espèces alpines et céréales des hautes régions."

Arrival of the Seeds in India.

With regard to the time and state of the arrival of the seeds in India, Dr. Wallich, expressing his grateful thanks to the Court of Directors, wrote on the 24th August 1839, that the noble packet of seeds dispatched on the 11th of May had arrived there on the 12th July. The seeds having been immediately sown, several had already vegetated; of these, the highly interesting Sea Island Cotton germinated in four days. Of the moderate supply of the latter, he had furnished small quantities to a number of practical men, as Capt. Jenkins and Dr. Wight. He particularly requests that assortments of seeds may be continued to be sent, especially those from South America and the West Indies, as they succeed, in general, remarkably well, and that on his part he would do his utmost to reciprocate, by endeavouring to obtain the sort of temperate zone seeds that are so much desired in England.

Dr. Falconer, to whom the first supplies had

Arrival of the Seeds in India.

been sent, complains of the packing not having been sufficient to keep out the wet, as some Mahogany seeds and others had arrived in a damp and rotten state. India rubber cloth having been adopted for the packing of all the subsequent despatches, he writes, "Your August and September despatches have arrived in excellent order. The double India rubber mode of packing is admirable—it could not be better." The seeds he describes as excellent of their kind, and the supply of vegetable seeds as exceedingly valuable. He requests a fresh supply, so as to reach him in February for sowing in the hills, also as many flower seeds as possible, both for sowing in the hills and plains.

Seeds from India.

The seeds collected in India, as is evident from the diversified nature of the country, will require very different kinds of climate. The kinds most valued here are such as are suited to the climate of the country, and therefore can only be obtained in the mountains, at such elevations as the region of Oaks. Those first sent, having been collected by the zeal of several officers, were more promiscuous in nature than is esteemed by the generality of horticulturists. But the later collections have been excellent in selection, and packed so perfectly well,

as to arrive here in as fresh a state as possible. This is evident from the following documents of the vegetation of seeds which hardly ever vegetated here before. Transmission of Seeds from India.

Speaking generally, it may be said that it is desirable to send a selection rather than a great variety of seeds. At first, from being collected in different localities, and by different individuals, many duplicate parcels were sent. It seems advisable, therefore, that seeds collected for transmission to this country should be forwarded to the Superintendents of the Botanic Gardens in the different presidencies, who should, with as little delay as possible, inspect, select, and if possible, name such as it was deemed necessary to send, and to separate the few from the plains and vallies requiring a hot climate from those suited to the open culture of this country. The kinds of seed most valued here are those of ornamental or useful flowering plants and shrubs, or such as are likely to be useful as timber trees, or otherwise. By this means, though the bulk and number of the packages would be curtailed, their value would remain undiminished.

The seeds received have been distributed to public

Distributed in the country and on the Continent.

gardens, and to distinguished individuals, both in Great Britain and on the Continent, keeping in view the interchange of seeds. The majority of those to whom seeds have been sent have expressed their intention of sending others in return, and many have already done so. I may instance Count Woronzow and M. A. De Candolle, as having already done so from the Continent. The opinions of Dr. Lindley and Messrs. Loddiges are subjoined, as shewing the success attending the new mode of transmission with seeds, received chiefly from Dr. Falconer.

Growth of Himalayan seeds in England.

"*Horticultural Society of London,*

"August 24, 1840.

"My dear Sir,—"I have great pleasure in informing you that the result of the seeds, for which we have so repeatedly been indebted to the liberality of the Honorable Court of Directors, has been most satisfactory. A very considerable number of fruit trees, shrubs, and handsome herbaceous plants have already been secured to the country. Among the former are the Deodar in abundance, as well as other Himalayan Coniferæ and Betula Bhojpattra, which would alone render the exertions of the Company in the introduction of new plants of national importance, especially since the large quantity of such things which is imported renders it practicable at once to disperse them through the country.

"Should you desire to have a detailed return of the plants of all kinds that have been raised in the Society's Garden, it shall be provided without loss of time.

"Yours faithfully,

"Professor Royle." "JOHN LINDLEY."

" Hackney, June 23, 1840.

" Dear Sir,—" We are happy to be able to inform you, that the seeds of Pinus Deodara which you were kind enough to send us, have grown perfectly well, scarcely one failing. Also Pinus Webbiana, excelsa, and Khutrow. The advantages of getting seeds overland are most decided; we have had great quantities of Deodara sent by sea from time to time, and hardly ever got one to grow, whereas these quite surpassed all our expectations.

" We remain, dear Sir, yours very truly,

" To Dr. Royle." " C. Loddiges & Sons."

LIST OF PLANTS,

SUITED FOR INTRODUCTION INTO DIFFERENT PARTS OF INDIA.

Annuals fit for Cultivation in the Plains of India during the cold Weather, and in the Himalayas during the Summer Months.*

Europe Corn Grasses
——— Vegetables
——— Sweet Herbs
Most Annuals of English Flower Gardens
Wheat and Egyptian Wheat
Barley
Bere
Bigg
Oats
Rye
Buckwheat
Mustard, Black and White
Rape, Colza
Flax
Tobacco, Virginia
——— Havanna
Tobacco, Persian
——— Latakia
Peas, Beans
Vetches, Tares
Edible Lupin
Clover, Red and White
Lucern
Alexandrine Clover
Turnips, Carrots
Beet-root
Mangel Wurzel
Skirret, Parsnip
Carraway, Fennel
Dill, Parsley
Aniseed
Hemlock, Foxglove
Belladonna, &c.

* The Annuals suited to the rainy season of every part of the plains, and even of some of the mountains of India, are already very numerous; consisting both of commercial articles, and of such as are fitted for food. Among the former we have Indigo, Cotton, Sugar Cane, and Tobacco, even with Rice, Maize, Sorghum, several species of Phaseolus and Dolichos, Paspalum, Panicum, Arum, Sesamum, Sun, and Sunnee, and many others. During this season Senna, &c. may be cultivated. Many introductions may be made from the West Indies and South America of new plants, or of varieties of the best kinds of those already cultivated in India.

*Perennials suited to the drier and more Northern parts of India.**

Liriodendron tulipifera	Oak Ilex
Capparis spinosa	—— Kermes
Acaciæ vera	—— Dyer's
——— Verek	—— Barbary
——— Seyal	Quercus tinctoria
Olive tree	Quercus Ægilops
Carob tree	Quercus Ballota
Manna Ash	Cactus opuntia
Laurel	——— Tuna
Sweet Bay	——— coccinellifer
Mastich tree	Morus alba
Chian Turpentine	——— multicaulis†
Pistachio Nut tree	Savine
Myrrh tree	Juniper
Sassafras tree	New Zealand Flax
Sumach tree	Poterium spinosum
Astragalus—yielding Tragacanth	Liquorice plant
	Aloe soccotrina
Cistus—yielding Labdanum	—— Barbadensis
Styrax officinalis	Euphorbia plant
Scammony	Assafœtida
Cork tree	Galbanum

* In his letter to the Secretary at the India House, copy of which, under date the 31st December 1838, was forwarded to the Agricultural and Horticultural Society of India by order of the Supreme Government, Dr. Royle states that he would add to this list "the common Spanish chesnut, which seems well suited to Northern India and the Himalayas, and would yield an additional article of food to the inhabitants of the Mountains, who are sometimes forced to subsist upon acorns and bitter horse chesnuts."—H. H. S.

† I am happy to add, that a plantation of this valuable mulberry is thriving luxuriantly at the Nursery of the Agricultural and Horticultural Society of India.—H. H. S.

Ammoniacum
Sagapenum
Artemisia Abrotanum
——— Santonica
Phœnix dactylifera
Diosmæ sp.
Eucalypti
Heaths
Proteas
Mesembryanthemums
Pelargoniums

Perennials suited to the Summer, and able to withstand the cold of the Himalayan Winter.

Almond, Peach
Apricot, Nectarine
Plum, Cherry
Apple, Pear, Quince
Spanish Chesnut
Filberts, Hazlenut
Gooseberry, Currants
Raspberry*
Rhubarb, all the kinds
Gentian, Jalap
Seneka
Juniper, Savine
Bilberries, Cranberries
Costus of the Ancients
Saffron
Europe and North American Timber Trees
Sugar-Maple, Hickories, and Black Walnuts
Oaks and Pines
Beech, Ash
Lime tree
American Magnolias
Tulip tree
Drimys Winteri
Rhododendrons, Azaleas
Kalmias, Heaths
Strawberry tree
Rhamnus infectoria
——— saxatilis, &c.
Lavender, Rosemary

* Some red Raspberry trees in a garden belonging to a private English gentleman in Calcutta produced ripe full sized fruit last year 1840.—H. H. S.

Tropical Perennials suited to the Plains, and some to the Mountains of the Southern parts of India.

Coffee,* Cacao
Pimento, Papaya
Nutmeg, Cloves
Cinnamon, Camphor
Cocculus palmatus
(Columba plant)
Telfairia volubilis
Pterocarpus erinaceus
(African Kino)
Elæis guineensis (Oil Palm)
Bixa orellana (Annotto)
Persea gratissima
Maranta arundinacea
Canna coccinea
Copaifera, yielding Balsam of Copaiba
Balsams of Peru and Tolu trees
Krameria triandra
Coutarea speciosa
Arenga saccharifera (Gomuto)
Cabbage Palm
Ceroxylon andicola
Vanilla and Tropical Orchideæ
Passion Flowers
Fuchsias
Ilex paraguayensis
Raphis vinifera
Sterculia acuminata
Sarcocephalus esculentus
Anona senegalensis
Chrysobalanus Icaco
Logwood, Mahogany
Nicaragua Wood
Quassia, Simaruba
Cinchonas, all the species
Cephælis Ipecacuanha
Psychotria emetica
——— herbacea
Smilax officinalis
——— medica, &c.
Guaiacum tree
Cusparia tree
Cascarilla plant
Croton Tiglium
Hymenæa Courbaril
Stillingia sebifera (Tallow tree)
Elæococca verrucosa (Oil tree)
——— vernicia (Varnish tree)

* Coffee has been found to thrive remarkably well about Calcutta, also at Chittagong and Sylhet. The produce has been pronounced by good judges as exceedingly good. See Transactions of Agricultural and Horticultural Society of India, vol. ii. Article 59.—H. H. S.

Agave, species of
Sanseviera guineensis
Baccharis genistelloides
Dipterix odorata (Tonquin Bean)
Cæsalpinia braziliensis, &c. (Brazil wood)
Jacaranda ovalifolia (Rose wood)
Hevea guianensis
Schinus molle
Bertholletia excelsa (Brazil Nut tree)

The foregoing lists are published as memoranda, nearly, as originally prepared. They might easily be rendered more copious, by an examination of the notices of the useful plants of different countries, but these are scattered, like the accounts of those of India, in a variety of publications, some Botanical, others Medical. A few are found in the lists of the Commerce of different countries, and others are mentioned by Travellers, of whom, however, but few are copious and exact in the relations, like Humboldt, or Spix and Martius. The names, to be fully useful to practical men, ought to be accompanied with a short account of the nature and uses of the different plants, their peculiar habits and culture, and the parts of India to which they appear best suited. This, it is evident, would require much time, in fact, constitute a work of itself. By referring to the Index, most of them will be found in the "Illustrations of Himalayan Botany," and generally with notices respecting the parts of India to which they are suited.

Western India.—*(continued.)*

From Dr. ELLIOTT *at Dhoolia in Khandeish, to Dr.* BROWNE, *Private Secretary to the Honorable the Governor of Bombay, dated 20th January,* 1840.

Agreeably to your request, I have the honour to forward a list of some of the plants growing in my garden, and also of such as in my opinion, are worthy of extension in this country, and of such as I consider suitable for introduction into this part of the country.

It can hardly be expected, nor do I consider it necessary, to enumerate every plant that I have in cultivation; but I trust that from those given, some idea may be formed of the capability of the soil and climate of Khandeish, as far as vegetation is concerned.

In classifying them, I have adhered to the form pointed out by the Committee of the Agricultural and Horticultural Society of Calcutta, and have arranged them under three divisions. Should the Society desire it, I shall be happy to furnish them hereafter with a more perfect and detailed account of

the state of Agriculture and Horticulture in Khandeish.

Division I.

Food comprising esculent grains of all kinds, medical plants, fruits, and roots.

Division II.

Fodder and food for cattle and domestic animals, comprising grasses, seeds, fruits, roots, and leaves, also any ornamental shrubs and flowers.

Division III.

Manufacturing and commercial articles, such as oils, gums, dyes, and barks, or any other known or unknown staples of commerce, such as oaks, firs, teak trees, &c. &c.

Which I have, for convenience, again divided each into three subdivisions; viz.

Subdivision 1*st.*

Comprising plants, &c. at present growing in Dhoolia.

Subdivision 2nd.

Those worthy of extension in this part of the country.

Subdivision 3rd.

Those supposed to be suitable for introduction into this neighbourhood.

And here I would beg leave to request, that should opportunity offer, I may be supplied with seeds or plants of such species of the 3rd subdivisions as I have underlined, which I am anxious to introduce into this province.

I have to apologize for the imperfect manner in which I have drawn up the list, and for the delay that has occurred in its preparation.

DIVISION I.

SUBDIVISION 1ST.

Medicinal Plants.

Acacia arabica.
——— Catechu.
Acorus calamus.
Allium sativum.
——— Porrum.
Amygdalus communis.
Anethum Fæniculum.
——— graveolens.
Artemisia Absinthium.
Capsicum annuum.
Cassia Ægyptiaca.
—— Fistula.
Citrus aurantium.
—— vulgaris.
Cochlearia Armoracia.
Coriandrum sativum.
Curcuma longa.
Datura Stramonium.
Daucus Carota.
Ficus Carica.

Hyoscyamus niger.
Laurus Cinnamomum.
Lavandula Spica.
Linum usitatissimum.
Malva sylvestris.
Mentha sativa.
——— piperita.
Morus nigra.
Myristica moschata.
Nicotiana Tabacum.
Origanum vulgare.
Oxalis acetosella.
Papaver somniferum.
——— Rhœas.
Punica Granatum.
Piper nigrum.
Ricinus communis.
Rosmarinus officinalis.
Ruta graveolens.
Stizolabium vel Mucuna pruriens.

Vegetable Roots, &c.

Artichoke.
——— Jerusalem.
Asparagus.
Basil.
Bean, garden or Windsor (does not thrive, nor bear well.)
Bean, kidney.
—— Madras (Phaseolus lunatus var.)
Beet.
Borecole.
Broccoli.
Cabbage.
Capsicum.
Cardoon.
Carrot.
Cauliflower.
Celery.
Clary.
Cress, garden.
—— water.
Cucumber.
Dolichos catjang.
——— lablab.
Endive.
Fennel.
Garlic.
Hibiscus Sabdariffa.
Horse-radish (Cochlearia Amoracia.)
Jatropha Manihot.
Leek.

Lettuce,
Marjoram.
Mint.
Mustard.
Nasturtium.
Onion.
Parsley.
Parsnip.
Pea,
Melon.
Peppermint.
Pompion.
Potatoe.
Radish.
Sage.
Salsify.
Savory.
Scarzoneira.
Spinage.
Succory.
Thyme.
Turnip.
Vegetable Marrow.

Fruits, &c.

Amygdalus communis (Almond)
——— persica (Peach)
——— flat or China do.
Annona muricata (sour-sop.)
——— reticulata, (netted custard apple.)
Annona squamosa (sweet-sop.)
Artocarpus integrifolia (Jack fruit.)
Averrhæa carrambola.
——— Bilimbi.
Bromelia ananas (pine) does not thrive here.
Carica Papaya.
Ceratonia siliqua (St. John's bread)
Citrus Aurantium.
——— Var. 1 Cintra.
——— 2 Konwla.
——— 3 Sweet China.
——— 4 Mosambique.
——— 5 Cape.
——— 6 Maltese, or bloody fruited.
——— Decumana (Shaddock.)
——— Limonum (Lemon.)
——— Limetta (Lime.)
——— Sweet Lime.
Coccos nucifera.

Dimocarpus Litchi.
Engenia Jambos or aquaca (rose apple),
Eriobotria japonica (loquat.)
Ficus carica.
Fragaria vesca.
Grewia asiatica.
Mangifera indica (mazagon mango.)
Morus alba, four varieties.
——— nigra.
Musa paradisiaca, four varieties.
Phœnix dactylifera.
Physalis peruviana.
Prunus armeniaca (Persian Apricot.)
Psidium pomiferum (red guava.)
——— pyriferum (white guava.)
Punica Granatum (red and white pomegranate.)
Punica nana (dwarf do.)
Pyrus malus.
Vitis vinifera, five varieties.
Zizyphus Jujuba, Bengal variety.

SUBDIVISION 2ND.

Medicinal Plants.

Allium.
Cassia ægyptiaca.
Cochleara armoracia.
Hyoscyamus niger.
Laurus cinnamomum.
Mentha piperita.
Morus nigra.
Myristica moschata.
Nicotiana tabacum, Persian variety.
Piper nigrum.

Vegetables, Roots, &c.

Jerusalem Artichoke: this might be extended with the greatest advantage, as it is very productive, will grow in any loose soil in the rainy season, and will require very little, if any water from the well.

Jatropha Manihot. This thrives well in any loose soil, and Tapioca might easily be made from it.

Fruits.

Amygdalus communis.
Morus nigra.

SUBDIVISION 3RD.

Medicinal Plants.

Aloe socotrina.
Alpinia Cardamomum.
Anthemis nobilis.
Carum Carui.
Cocculus palmatus.
Conium maculatum.
Convolvulus Jalapa.
——— *Scammonia.*
Copaifera Langsdorfii.
Croton Eleuteria vel Cascarilla.
—— *Tiglium.*
Cucumis colocynthis.
Cuminum Cyminum.
Eugenia caryophyllata.
Glycyrrhiza glabra.
Justicia paniculata (Creat)
Laurus Cassia.
Laurus Cinnamomum.
——— *Sassafras.*
Myristica moschata.
Olea europæa.
Pimpinella Anisum.
Piper Cubeba.
—— *longum.*
—— *nigrum.*
Prunus domestica.
Pterocarpus santalinus.
Pyrus Cydonia.
Rheum palmatum.
Sambucus nigra.
Stalagmitis Cambogioides.
Thea viridis.

Vegetables, &c.

Arrow-root, maranta arundinacea.
Chives (allium schænoprasum.)
Rocambole (Allium Scorodoprasum.)
Shallot (Allium Ascalonicum.)
Sea-kale (Crambe maritima.)
Skirret (Sium sisarum.)

Fruits, &c.

Apple, English.
Apricot.
Bread Fruit (Artocarpus incisa.)
Cherry.
Juglans regia, Walnut.
Long-yen (Dimocarpus longan.)
Mangosteen (Garcinia Mangostana.)
Peach, English.
Pear.
Quince.
Raspberry.
Sago Palm (Sagus rumphü.)

DIVISION II.

SUBDIVISION 1ST.

Food for Cattle.

Clover and Lucerne grow well, but as they require frequent weeding and manuring, as well as artificial irrigation, cultivators cannot gain any profit by growing them, unless it be in the neighbourhood of large cantonments, where European gentlemen will purchase them for their horses.

Agrostis linearis, known by the natives as Doorwa in Mahratta.

Ornamental Trees, &c.

Agave americana.
Aloe, several species.
Agyreia cuneata.
Ailantus excelsa.
Bauhinia, several species.
Bignonia chelonoides.
——— stans.
Bignonia undulata.
Borassus flabelliformis.
Canna indica.
——— lutea.
Butea frondosa.
Caprifolium japonicum.
Caryota urcus.

Cassia grandis, and other species.
Casuarina species.
Cerbera thevetia,
Chrysanthemum, several species.
Clematis, two species.
Clerodendrum fragrans.
Croton variegatum, 3 varieties.
Cactus grandiflorus.
——— hexagonus.
——— Opuntia.
——— inermis.
——— other varieties.
——— Pereskia.
——— truncatus.
Cupressus sempevirens, both var.
Dahlia—flore pleno.
Datura fastuosa.
Dianthus caryophyllus.
Gærtnera racemosa.
Geranium, ten species.
Hibiscus Abelmoschus.
——— mutabilis.
——— phæniceus.
——— populneus.
——— rosa sinensis.
Hoya carnosa.
Jasminum auriculatum.
——— fruticans.
——— grandiflorum.
Jasminum officinale.
——— Zambac-flore pleno.
Jatropha multifida.
Ipomæa braziliensis.
Justicia variegata, three varieties.
——— Betonica.
Lagerstræmia indica.
——— regina.
Lantana, several varieties.
Michelia Champaca.
Myrtus communis.
Narcissus tazetta.
Nercium odorum, several var.
Nyctanthes arbor-tristis.
Œnothera nocturna.
——— tetraptera.
Pandanus odoratissimus.
Passiflora fœtida.
——— laurifolia.
——— minima.
——— other species.
Pergularia minor.
Plumbago capensis.
——— europæa.
——— rosea.
——— zeylanica.
Punica Granatum-flore pleno.
Quisqualis indica.
Rhinanthus crista-galli.

Rose, climbing.
—— Edward.
—— glandulifera.
—— indica.
—— maidens'-blush.
—— microphylla.
—— Persian.
—— rubiginosa, sweet-briar.
Stachytarpheta mutabilis.
Sirium myrtifolium.
Tabernæmontana coronaria.
Thumbergia alata.
———— grandiflora.
Thuya orientalis (arbor vitæ.)
Valeriana rubra.
Valeriana Lamberti ?
Several English annuals, and exotic bulbous plants.

SUBDIVISION 2ND.

Fodder for Cattle.

Agrostis linearis, this can be cultivated at a very trifling expense, may be grown in almost any soil, even without artificial irrigation; but if watered, will produce three or more crops of grass, which when dried, forms as good hay as can be desired; it requires little or no weeding, as it overpowers all other grasses.

Ornamental Trees, &c.

Bignonia undulata.
Cactus Opunita, for feeding the Cochineal Insect.
Thuya orientalis.

SUBDIVISION 3RD.

Aquilegia vulgaris.
Camellia japonica.
Crocus, different species.
Cuppressus thyoides.
Ericæ, different species.
Hydrangea hortensis.

Jonesia pinnata or asoka.
Magnolia conspicua.
Pæonia, different species.
Pinus longifolia.
Primula, different species.
Quercus Ilex.
Rhododendron (Neilgherry.)
Rosa museosa (Moss. Rosa.)
Syringa chinensis.
——— *vulgaris.*
Any English annuals.

DIVISION III.

SUBDIVISION 1ST.

Acacia arabica.
Areca Catechu.
Artocarpus integrifolia (Jackwood.)
Bambusa arandinacea.
Dalbergia latifolia (Blackwood.)
Gardenia gummifera. Dikhamalee.
Hibiscus populneus, from the seed vessels of this, I am told Gamboge can be procured.
Indigofera tinctoria.
Melia Azadirachta (Timber.)
Tectona grandis.
Wrightia tinctoria vel Nerium tinctorum (du.)

SUBDIVISION 2ND.

Acacia arabica.
Artocarpus integrifolia.
Dalbergia latifolia.
Gardinia gummifera.
Indigofera tinctoria.
Melia Azadirachta.
Tectona grandis.

SUBDIVISION 3RD.

Calamus rudentum (rattan cane.)	*Carypha talicra.*
Coccus cacti.	*Quercus Robur.*
Carypha mubraculifera.	——— *Suber.*

THE END.

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Government of Maharashtra
on 18 July, 2018